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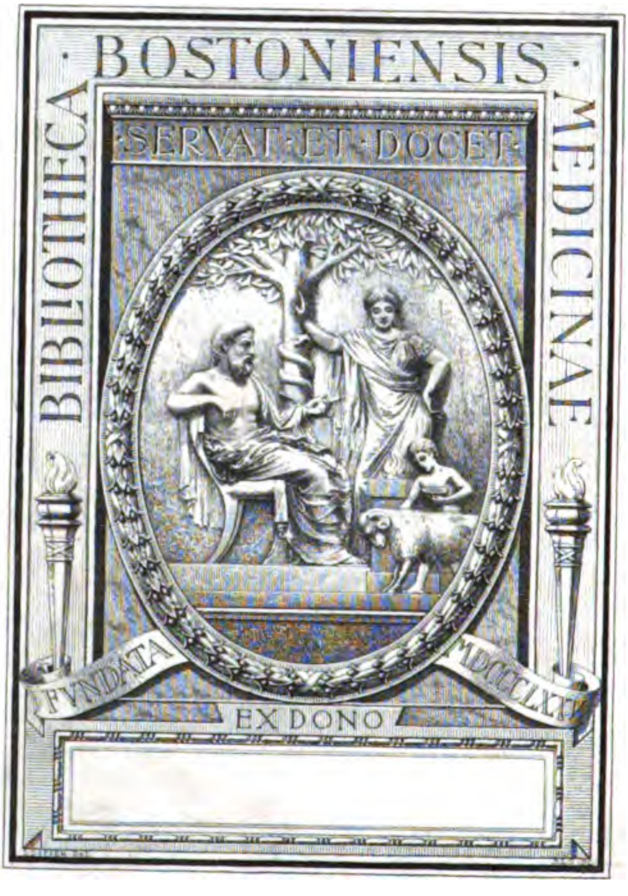
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CONTRIBUTORS TO VOLUME XV.

1906.

Ball, James Moores, M. D., St. Louis	78
Blaise, T. T., M. D.	248, 259, 287
Brown, Samuel Horton, M. D., Philadelphia	237
Bruns, H. Dickson, M. D., New Orleans, La.	543
Carlini, Vittorio, Livorno	203
Coburn, Edward B., M. D., New York	230
Collins, Sir William Job, M. S., M. D., B. Sc. Lond., F. R. C. S. Eng.	39
DeBeck, David, Sc. B., M. D., Seattle, Wash.	359
De Schweinitz, G. E., M. D., Philadelphia	498
Fehr, O., M. D.	491
Fisher, Waldemar E., M. D., St. Louis	1
Frank, Mortimer, M. D., B. S., Chicago	7
Freytag, Gustav, M. D., Munich	248
Gould, George M., M. D., Philadelphia	85, 369, 381, 393
Green, John, Jr., M. D., St. Louis	13
Hansell, Howard F., M. D., Philadelphia	529, 537
Henderson, F. L., M. D., St. Louis	374
Hinshelwood, James, M. A., M. D., Glasgow	214
Hirschberg, Prof. J., Berlin	491
Howe, Lucien, M. D., Buffalo	277, 418, 433
Jennings, Ellis J., M. D., St. Louis	199
Kraemer, A., M. D., San Diego	239, 390
Kane, H., M. D., Vienna	259
Loeb, Clarence, A. M., M. D., St. Louis	32, 239, 243, 390
Lohmann, W., M. D.	287
Meyer, Dr., Marine-Oberstabsartz, Tsingtau	243
Napier, Francis H., M. B., B. S., London	218
Newcomet, William S., M. D., Philadelphia	518
Oliver, Chas. A., A. M., M. D., Philadelphia	11
Ovio, Prof. G.	97
Parker, Frank C., M. D., Norristown, Pa.	233
Raia, V. L., M. D., Providence, R. I.	97, 203

Reichert, Edward T., M. D., Philadelphia............ 59
Robin, Ernst A., M. D., New Orleans................543
Ryerson, G. Sterling, M. D., L. R. C. S. Edin, Toronto..526
Shoemaker, William T., M. D., Philadelphia......201, 388
Suker, George F., M. D., Chicago.................. 65
Terson, Albert, Paris...............................424
Thompson, J. J., M. D., New York.................... 76
Wilkinson, Oscar, M. D., Washington...............268
Wright, J. W., M. D., Columbus, Ohio................285
Zentmayer, William, M. D., Philadelphia.............534
Ziegler, G. Lewis, Philadelphia....................... 72
Zimmerman, M. W., M. D., Philadelphia...............544

ORIGINAL ARTICLES, VOL. XV.

1906.

A Brief Summation of the Interrelationship of Binocular Fields of Color Vision and Combined Areas of Astigmia 11

A Life and Career Blighted By Ignored Eyestrain...... 381

A New Contribution to Congenital Pigmentation of the Cornea 390

A Report Upon the Eyes on Four Classes of College Freshmen at the University of Pennsylvania........ 544

A Series of Sixty-Three Cases of Descending Optic Neuritis, Probably the Result of Pneumococcal Infection. 218

A Schematic Eye—An Instrument for the Luminous Demonstration of the Functions of the Various Parts of the Eye of Normal and Abnormal Refraction and of the Application of Glasses in Disorders of Refraction 59

A Case of Amaurotic Family Idiocy, with an Appendix of Reported Cases.......... 7

A Case of Bilateral Anophthalmos.......... 97

A Case of Chorioido-Retinal Sclerosis with Spontaneous Dislocation of the Lenses, Complete and Incomplete. 388

A Case of Epithelioma of the Ocular Conjunctiva of Unusual Size 199

A Case of Double External Rectus Paralysis, Traumatic in Origin 529

A Case of Subhyaloid Hemorrhage—With Remarks on the Source and Anatomic Situation of this Variety of Intraocular Hemorrhage.......... 78

Additional Information Concerning Credé's Silver Therapy in Diseases of the Eyes.......... 243

Amaurosis Following Acute Anemia from Hemorrhage: A Clinical Contribution.......... 203

Astigmatic Accommodation: A Study of Its Relative Frequency in 50 Cases with Marked Asthenopic Symptoms 268

INDEX

Bilateral Lymphomata of the Lacrimal, Parotid and Submaxillary Glands, Due to Tonsillar Hypertrophy and Consequent Suboxidation 72

Bilateral Gumma of the Orbits in a Child Eight Years of Age 233

Chorioidal Diseases: Their Relation to General Diseases and Particularly to Infections, Intoxications and Auto-Intoxications 498

Coloboma Maculæ Luteæ 1

Congenital Pigmentation of the Cornea 239

Dionin in Ophthalmic Practice 214

Embolism of a Cilio-Retinal Artery; Loss of One Eye Through Gonorrhœal Conjunctivitis; Endocarditis; Sequelæ of Gonorrhœal Urethritis 534

Field of Fixation and Methods of Measuring It 277

Gummatie of the Cornea 424

Hysterical Binocular Amaurosis 374

Inflammation of the Eyes Due to Infection from Hay Fever, Conveyed by Tobacco Smoke, with Report of Cases 285

Operative, Post-Operative and Traumatic Infections of the Eye, Including Those Arising from Instillations and Instruments 537

On a Rare Development of a 'Pinguecula, also from an Etiological Viewpoint 287

On the Center of Motion and the Angle Alpha 418

Persistent Hyaloid Artery in Both Eyes—Unusual Variety in One Eye 201

Preliminary Note on Enucleation of Eyeball Under Local Anesthesia 543

Progress of a Year—In the Recognition of Eyestrain Reflexes 393

Pyemia, Orbital Cellulitis and Death, Following the Use of Mesotan 230

Report of a Case of Primary Tuberculosis of the Conjunctiva 76

Report of a Case of Homatropin Poisoning 237

INDEX

Report on the Progress of Ophthalmology in the Year 1905 13

Scopolamin and Morphin Anesthesia in Ophthalmic Surgery 65

Some Cases of Associated Coloboma Oculi and Arteria Hyaloidea Persistens 359

Some Cellular Changes in the Primary Optic Vesicles of Necturus 32

The Crystalline Lens in Health and in Cataract.......... 39

The "Exaggeration" and Hobby-Riding of the Eyestrain Theorist 85

The Knowledge of Lymphangioma Orbitæ.......... 259

The Late Changes of Specific Chorio-Retinitis.......... 491

The Ophthalmic Sins of Hospitals.......... 369

The Science of Paradoxic Lid-Motion.......... 248

The Surgical Treatment of Trachoma.......... 526

The Therapeutic Application of the X-Ray in Diseases of the Eye 518

INDEX OF SUBJECTS MENTIONED IN THE ANNALS DURING THE YEAR 1006, VOLUME XV.

ABSTRACTS:
  —Anglo-American 101, 291, 430, 549, 568.
  —French 130, 479, 594.
  —German 303, 467, 572.
  —Spanish 607.
A BRIEF SUMMATION of the the interrelationship of binocular fields of color, vision and combined areas of astigmia 11.
A BINOCULAR pupildometer 467.
ABLATION of total staphyloma of the cornea, observation regarding a method of 609.
ABSCESS, two cases of orbital 340.
ABSCISSION, corneal 111.
A CASE of amaurotic family idiocy, with an appendix of reported cases 7.
A CASE of Basedow's disease without exophthalmos treated by antithyreoidin moebius 583
A CASE of bilateral anophthalmos 97.
A CASE of bilateral abducens paralysis after spinal anesthesia, associated with excrutiating cephalalgia and pain in the cervical region 579.
A CASE of buphthalmos 176.
A CASE of cephalic tetanus following a contusion wound on the outer canthus 113.
A CASE of Chorioido-Retinal Sclerosis with spontaneous dislocation of the lenses, complete and incomplete 388.
A CASE of complete traumatic detachment of the retina from the optic nerve 327.
A CASE of double external rectus paralysis, traumatic in origin 529.
A CASE of double persistent hyaloid canal 177.
A CASE of epithelioma of the ocular conjunctiva of unusual size 199.
A CASE of gumma of the optic nerve back of the papilla, and gummatous chorioiditis 331.
A CASE of hypertrophia 565.
A CASE of sarcoma of the eye involving chiefly the ciliary body 122.
A CASE of subhyaloid hemorrhage 78.
A CASE of symmetrical congenital absence of the chorioid and retina except in the macular area 121.
A CASE of vesicular keratitis, with a filamentous formation of the detached epithelium 355.
ACID burn, nitric 157.
ACCOMMODATION, relation of convergence to 186.
A CONTRIBUTION to Parinaud's conjunctivitis 308.
A CONTRIBUTION to the symptomatology of Barlow's disease 310.
A CONTRIBUTION to the treatment of Basedow's disease by the antithyreoidin serum of Moebius 583.
ACUTE RETROBULBAR NEURITIS probably due to sinusitis 180.
ACUTE edema of eyelids 134.
ACUTE glaucoma following iridectomy for simple glaucoma 602.
ADVANCEMENT, muscle 599.
ARTERIO-SCLEROSIS, ocular 606.
ADDITIONAL information concerning Crede's silver therapy in diseases of the eyes 243.
A FAMILY with irideremia 117.
AFASIA complicating ophthalmic migraine caused by defects of refraction 608.

INDEX

AFFECTIONS of the eye due to auto-intoxication 309.

AFFECTIONS of the eye, metastatic 569.

ALCOHOL, injections of, in blepharospasm 482.

ALCOHOL, injection of in facial spasm 482.

A LIFE and career blighted by ignored eyestrain 381.

ALLOYS, steel, which are not magnetic 428.

ALYPIN, a new anesthetic 318.

ALYPIN 586.

ALYPIN, a new local anesthetic 105.

ALYPIN, a new local anesthetic 479.

ALYPIN in office work 579.

ALYPIN, its uses in ophthalmology 309.

ALYPIN, the new local anesthetic 106.

AMAUROSIS following acute anemia from hemorrhage; a clinical contribution 203.

AMERICAN Medical Association —Work of the Section on ophthalmology 441.

AMETROPIA, the symptoms of 178.

AMYLOID degeneration of the lids and conjunctiva 326.

AMYLOID degeneration in the eyeball and ocular vessels 591.

ANATOMY of the lacrimal sac with special reference to the lacrimal sac glands 321.

ANESTHESIA, combined, by chloride of ethyl and chloroform 480.

A NEW contribution to congenital pigmentation of the cornea 390.

A NEW eye symptom in Graves' disease 561.

A NEW ophthalmic outfit for bedside examination 151.

A NEW supplementary color vision test 436.

ANGIOMA, cavernous 341.

AN improved electro magnet for use in eye surgery 570.

AN improved thermo-cautery for eye work 112.

ANIRIDIA, traumatic 148.

ANOMALIES, motor 599.

ANOTHER set of test types 594.

ANTE-PARTUM ophthalmia 437.

ANTIPYRINE keratitis 564.

ANTISTAPHYLOCOCCUS serum in dacryocystitis, The use of, Doyen's 319.

APPARATUS for the detection of metallic, other than iron, foreign bodies in the eye—The Metallophon 305.

A PRACTICAL demonstration of the filtration of the eye liquids through Schlemm's channel with Leber's manometer 609.

AQUEOUS secretion, a case of suppression of 465.

A REPORT upon the eyes of four classes of college freshmen at the University of Pennsylvania 544.

ARGYROL, argyrosis from 188.

ARGYROL in conjunctivitis 601.

ARGYROL in ophthalmic practice 106.

ARGYROSIS from argyrol 188.

ARGYROL in ophthalmology 585.

ARTIFICIAL cyclopegia in errors of refraction 553.

ATLAS and epitome of operative ophthalmology 194.

A SCHEMATIC eye; an instrument for the luminous demonstration of the functions of the various parts of the eye of normal and abnormal refraction and of the application of glasses in disorders of refraction 59.

A SECURE, looped, single-stitched advancement suture, with a consideration of scleral anchorage 563.

A SERIES of sixty-three cases of descending optic neuritis, probably the result of pneumococcal infection 218.

ASTIGMATIC accommodation: A study of its relative frequency in 50 cases with marked asthenopic symptoms 268.

ASTIGMATISM after simple extraction, as modified by the conjunctival flap 146.

ASTIGMATISM a cause of vomiting in school children 121

A STUDY of the nativity, sex and age, occupation and social condition of 3436 cases of senile cataract operated upon at the Wills Hospital in Philadelphia 549.

ATROPINE sulphate and of homatropine hydrobromate, the effects of "full" and "minimum" 565.

ATROPHY, optic nerve 343.

AURICULAR cartilage in defects of the lid, additional observations on the utilization of the 309.

AUTO-INTOXICATION, affections of the eye due to 309.

A YELLOW peril 300.

BACTERIOLOGY of serpent ulcer 459.

BACTERIA, the pathogenic, of the conjunctiva 449.

BARLOW'S DISEASE, a contribution to the symptomatology of 310.

BASEDOW'S DISEASE, a contribution to the treatment of, by the antithyreoidin serum of Moebius 583.

BASEDOW'S DISEASE, radiotherapy in 481.

BASEDOW'S DISEASE without exophthalmos treated by antithyreoidin Moebius 583.

BIER-KLIPP suction appliance as a substitute for the heurteloup apparatus 584.

BIER'S "Passive Hyperemia" treatment to diseases of the eye 311.

BILATERAL abducens paralysis after spinal anesthesia associated with excruciating cephalagia and pain in the cervical region 579.

BILATERAL gumma of the orbit 341.

BILATERAL gumma of the orbits in a child 8 years of age 233.

BILATERAL lymphomata of the lacrimal, parotid and submaxillary glands, due to tonsillar hypertrophy and consequent suboxidation 72.

BILATERAL metastatic ophthalmitis 343.

BILATERAL retinal detachment with increased intraocular tension in a case of albuminuric retinitis of pregnancy 471.

BIRDSHOT injuries of eye 460.

BITEMPORAL hemianopsia 136.

BITEMPORAL hemianopsis and diabetes insipidus 328.

BLEPHAROSPASM caused by the eruption of a tooth 318.

BLEPHAROSPASM, injection of alcohol in 482.

BLINDNESS, infantile cerebral diplegia with 114.

BLINDNESS, monocular, occasioned by visible spasm of the central artery of the retina 184.

BLINDNESS in Mexico, ophthalmia neonatorium as a cause of. The importance of its prevention by publishing its dangers among doctors, midwives and the public 607.

BLIND spot, spindle-shaped enlargement of, associated with congestion of the optic disk 110.

BLOCKING of the lymphatics of the anterior segment of the eyeball 144.

BOOK reviews 194.

BOOK reviews 616.

BULBAR conjunctiva, disease of 169.

BUPHTHALMOS, a case of 176.

CARCINOMA, metastatic chorioidal 330.

CARCINOMA, metastatic, of the chorioid 588.

CASE of multiple cyst-formation of both lower fornix folds 120.

CATARACT extraction and cataract ripening 333.

CATARACT, a lecture on the art of extracting 461.

CATARACT extraction, contact keratitis after 442.

CATARACT, extraction of, in the capsule 292.

CATARACT extraction, glaucoma after 132.

CATARACT extraction, notes on 462.

CATARACT extration, the success which at the present day attends the operation of, and the causes that contribute to it 124.

CATARACT, extraction of, under various constitutional conditions 464.

CATARACT in tetany, diabetic and senile cataract 473.

CATARACT, hereditary, some forms of 346.

CATARACT, on some points in relation to extraction of 294.

CATARACT operation of antyllos 305.

CATARACT, the operation for 302.

CAVERNOUS angioma 341.

CAVERNOUS sinus, septic thrombosis of 134.

CENTRAL artery, probable bilateral obstruction to 192.

CENTER of motion, calculation of the, by means of the Javal-Schiotz ophthalmometer 418.

CENTRAL scotomas, mascular fatigue, in certain psychoses 350.

CEREBRAL disease, misleading symptoms in 458.

CEREBRAL lesion, a minute 463.

CEREBRAL tumor, the resolution of choken disk in 334.

CEREBROSPINAL meningitis 340.

CERVICAL ganglion, action of nicotin upon the 130.

CHALAZIA, a simple method of operating upon certain forms of 318.

CHANCRE of the eyelid with interstitial keratitis 173.

CHANGES in the eye-ground in otitic diseases of the brain, the cerebral membranes and the sinuses 552.

CHORIOID, a case of symmetrical congenital absence of, and retina except in the macular area 121.

CHORIOID and ciliary body, leuco-sarcoma of 177.

CHORIOID, leuco-sarcoma of, with secondary involvement of the ciliary body 143.

CHORIOID and orbit, melanosarcoma of the 557.

CHORIOID, pigment naevus of 578.

CHORIOID, recognition of sarcoma of the 468.

CHORIOID, tuberculosis of 486.

CHORIOD, tubercurosis of 572.

CHORIOIDAL diseases; Their relation to general and particularly to infections, intoxications and auto-intoxications 498.

CHORIOIDAL hemorrhage following cataract extraction 568.

CHORIOIDITIS, disseminated sympathetic 113.

CHORIOIDORETINAL sclerosis, a case of, with spontaneous dislocation of the lenses, partial and complete 354.

CHORIS-VAGINAL veins 438.

CHRONIC glaucoma, the establishment of a filtrating cicatrix in 488.

CILIARY ganglion, inflammatory affection of 103.

CILIARY nerves, the division of, without injury to the optic nerve 593.

CIRCULAR letter from Dr. DeBeck 338.

CLINICAL observations 442.

COLOR blindness, the relation of the facts of, to the psychophysical theory 105.

COLOBOMA, double chorioidal 342.

COLOBOMA maculae luteae 1.

CONJUGATE lateral deviation 453.

COLOR conversion 430.

COLOR-IMAGES, simultaneous contrast 139.

COLORED tattooing of the cornea 485.

COLOR sense, determination of 594.

COLOR vision test, a new supplementary 436.

COMBINED anesthesia by chloride of ethyl and chloroform 480.

COMBINED transverse keratotomy 324.

COMPLICATIONS of heterochromis 589.
CONCERNING metastatic carcinoma of the chorioid 588.
CONCERNING the nature of simple pigmentary atrophy of the retina 596.
CONCERNING the occurrence of amyloid degeneration in the eyeball and ocular vessels 591.
CONCERNING the pathway of certain post-operative infections 170.
CONGENITAL pigmentation of the cornea 239.
CONGENITAL tubular growth 187.
CONVERGENT squint 431.
CONCERNING the prevention of ophthalmia by sophol 469.
CONGENITAL hydrocephalus 441.
CONICAL cornea, a successful operation for 563.
CONJUGATE ocular paralysis 131.
CONJUNCTIVA, essential shrinking of 187.
CONJUNCTIVA, inflammation of 436.
CONJUNCTIVA, the pathogenic bacteria of 449.
CONJUNCTIVA, tuberculosis of 458.
CONJUNCTIVAL incrustations following the use of hydrogen peroxide 578.
CONJUNCTIVAL irritation, excited by proximity to a horse 162.
CONJUNCTIVITIS, argyrol in 601.
CONJUNCTIVITIS, Parinaud's 305.
CONJUNCTIVITIS, pneumococcus 191.
CONNECTIVE tissue formation on the posterior corneal surface 468.
CONTACT keratitis after cataract extraction 442.
CONVERGENCE, relation of, to accommodation 186.
CONVERGENCE and its defects 454.
CONVERGENT squint in young children, some observations on Worth's methods of treatment of 562.
CORNEA, colored tattooing of 485.
CORNEAL abscission 111.
CORNEAL flaps, keratectomy with 601.
CORNEAL surface, connective tissue formation on the posterior 468.
CORNEAL ulceration due to the diplobacillus 320.
CORNEAL wounds, the infection of, with sputum 469.
CORNEA, triangular opacities in the superficial layers of 175.
CYCLOPEGIA, artificial, in errors of refraction 553.
CYST-FORMATION, a case of multiple, of both lower fornix folds 120.
CYST-FORMATION, epithelian, in the iris, with illustrative cases 553.
CYCLOPEGICS, indications of, in determining defects of refraction 611.
CYCLOPEGICS, observations on, in determining ocular refraction 612.
CYST, Dermoid, of the orbit 339
CYST of the iris 181.
CYTOTOXIC serums and ophthalmia sympathetica 133.
DACRYOCYSTITIS following operation for empyema of the antrum 319.
DACRYOCYSTITIS, the use of Doyen's antistaphylococcus serum in 319
DECEMET'S membrane, a clinical note upon clefts in 464.
DECEMET'S membrane, concerning isolated ruptures of 472.
DEFECTS, convergence and 454.
DEGENERATION, amyloid, of the lids and conjunctiva 326.
DEMENTIA paralytica, the early ocular signs of 127.
DEMONSTRATION of the filtration of the eye liquids through Schlemm's channel with Leber's manometer 609.
DENDRITIC and interstitial keratitis 176.
DENDRITIC keratitis 342.
DERMOID cyst of the orbit 339.
DERMOIDS of the orbit 433.

DERMOID tumor of the bulbar conjunctiva 159.
DETACHMENT, bilateral retinal, with increased intraocular tension in a case of albuminuric retinitis of pregnancy 471.
DETACHMENT, of chorioidal and retinal, associated with cyclic albuminuria 328.
DETACHMENT of the retina, the treatment of 135.
DETERMINATION of the color sense 594.
DEVIATION, conjugate lateral, 453.
DIABETIC and senile cataract, cataract in tetany, 473
DIAGNOSIS and treatment of syphilitic eye diseases 610.
DIONIN in ophthalmic practice 214.
DIPHTHERIA, osteo-periostitis and sinusitis following, 596.
DIPLOBACILLUS, morax-axenfeld, 466.
DISEASE of the bulbar conjunctiva 169.
DISEASES of the eye, manual of 195.
DISEASES of the tear channels, etiology of 608.
DISLOCATION of the eyeball, spontaneous 165.
DISORDERS from eyestrain 123.
DISTRIBUTION, geographical, of trachoma in Hungary 593.
DISSEMINATED sympathetic chorioiditis 113.
DIVISION of the ciliary nerves without injury to the optic nerve 593.
DOUBLE blepharoplasty 139.
DOUBLE choriodal coloboma 342.
DOUBLE perforation of the sclera 143.
EARLY ocular signs of dementia paralytica 127.
ECLIPSE, ocular troubles from observing an 604.
EFFECTS of prolonged lactation on the eyes 560.
ELECTRO-MAGNET, an improved, for use in eye surgery 570.
ELEPHANTIASIS of the lid from repeated erysipeloid attacks, with sinusitis maxillaris 597.
EMBOLISM of the central retinal artery 346.
EMBOLISM of a cilio-retinal artery; loss of one eye through gonorrheal conjunctivitis; endocarditis; sequelae of gonorrheal urethritis 534.
EMBOLISM of the retinal arteries, the treatment of recent, by digital massage 295.
EMPYEMA of the antrum, dacryocystitis following operation for 319.
ENTROPION operation, with removal of Tarsus 598.
ENOPHTHALMUS, traumatic 596.
ENDOTHELIOMA, a case of 558.
ENUCLEATION under combined local anesthesia 325.
ENUCLEATION under local anesthesia 480.
EPILEPSY and eyestrain 121.
EPIPHORA unassociated with lacrimal obstruction 153
EPITHELIAN cyst formation in the iris, with illustrative cases 553.
EPITHELIAL plaque of cornea 462.
ERRORS of refraction, recognition of, in functional diseases of the nervous system 119.
ERYSIPELAS, optic nerve atrophy following 489.
ESSENTIAL shrinking of the conjunctiva 187.
ETHMOIDITIS 341
ETIOLOGY and treatment of diseases of the tear ducts 609.
ETIOLOGY of diseases of the tear channels 608.
EUPHTHALMIN conjunctivitis 103.
EXCISION of the lachrymal sac 483.
EXCRESENCES of the ora serrata 485.
EXOPHTHALMIC goiter, an antiserum for 102.
EXOPHTHALMIC goiter, serum treatment of 101.
EXOPHTHALMIC goiter, therapeutic serum for 446.

EXOPHTHALMIC goiter, the surgical treatment of 456.
EXOPHTHALMOS, unilateral, of, traumatic origin 356.
EXPULSIVE hemorrhage and rupture of the cornea 603.
EXTIRPATION of the lacrimal sac 435.
EXTIRPATION of the lacrimal sac 577.
EXTRACTING for cataract, a lecture on the art of 461.
EXTRACTION of cataract in the capsule 292.
EXTRACTION of cataract, on some points in relation to 294.
EXTRACTION of cataract under various constitutional منditons 464.
EXTRACTION of senile cataract 291.
EXTRACTION of steel from the lens 191.
EYE, birdshot injuries of 460.
EYE, nutrition and nutritive channels of 131.
EYEBALL, protection of, during X-Ray applications 481.
EYEBALL, the pathogenic bacteria of 451.
EYE-GROUNDS, the changes in the, in otitic diseases of the brain, the cerebral membranes, and the sinuses 552.
EYE infection; second hundred cases with bacteriological examination 119.
EYE infection; third hundred cases with bacteriological examination 566.
EYE injuries, Fourth of July 441.
EYE, vaccinia of 312.
EYELIDS, symmetrical gangrene of the, following an injury to the frontal region 475.
EYELIDS, acute edema of 134.
EYESTRAIN, disorders from 123.
EYESTRAIN and epilepsy 121.
EYESTRAIN, some incurable 456.
EYE-SYMPTOMS in disseminated sclerosis of the brain and spinal cord 115.
FACIAL spasm, injection of alcohol in 482.
FIELD of fixation and methods of measuring it 277.
FOR eye bacteria, staining methods 430.
FOREIGN bodies in the eye, the localization of 107.
FOURTH of July eye injuries 441.
FUNDUS, a benign stationary tumor of 332.
FRONTAL sinus, purulent inflammation of, simulating disease of the lacrimal sac 151.
FRYNIN, influence of, on the eye 110.
GANGRENE of the eyelids, symmetrical, following an injury to the frontal region 475.
GERMAN Hospital of Philadelphia, history of the, and its ex-resident physicians 624.
GLASSES in railway service, advantages and disadvantages of 297.
GLAUCOMA, acute, following iridectomy for simple glaucoma 602.
GLAUCOMA after cataract extraction 132.
GLAUCOMA, secondary 183.
GLAUCOMA, sympathectomy in 319.
GLEONIA of the retina—reports of four cases 561.
GOITER, an antiserum for exophthalmic 102.
GOITER, surgical treatment of 103.
GOITER, therapeutic serum for exophthalmic 446.
GUAIACOL in ophthalmology, the therapeutics of 576.
GRAVES' disease, a new eye symptom in 561.
GUMMA, a case, of the iris and ciliary body 462.
GUMMA of the optic nerve back of the papilla, and gummatous chorioiditis 331.
GUMMA of the orbit, bilateral 341.
GUMMATIE of the cornea 424.
GUN-SHOT wound of the orbit 139.
HEMIANOPSIA, bitemporal 136.
HEMIANOPSIA, bitemporal, and diabetes insipidus 328.
HEMORRHAGE, choriodal, following cataract extraction 568.
HEMORRHAGE, expulsive, and rupture of the cornea 603.

HEMORRHAGE, spontaneous, into the orbit in women 595.

HEMORRHAGE, spontaneous, into the vitreous 297.

HEREDITARY cataract, some forms of 346.

HEREDITARY optic neuritis (Leber) of legal interest 478.

HETEROCHROMIA, complications of 589.

HIGH degree of myopia, later results of the operative treatment of 592.

HIGH myopia, removal of the lens in 345.

HIGH myopia, results of extraction of the lens in 487.

HIGH myopia, some lesions of 164.

HIGH myopia, transparent lens removed for 159.

HIGH myopia, transparent lens removed for 160.

HISTORY of the German Hospital of Philadelphia and its ex-resident physicians 624.

HOMATROPIN poisoning 445.

HOWE'S resolution on test methods 433.

HYALOID artery, persistent, both eyes; unusual variety, left eye 355.

HYALITIS, specific 568.

HYALOID artery, retained 344.

HYDROCEPHALUS, congenital 441.

HYDROGEN peroxide, conjunctival incrustations following the use of 578.

HYPERTROPHIA, a case of 565.

HYSTERICAL binocular amaurosis 374.

HYSTERIA, common ocular complications of 166.

HYSTERICAL paroxysm, pupillary inaction as observed in 314.

ILLUMINATION of visual test-types, a more uniform standard for the 431.

IMMUNITY, the doctrine of, in ophthalmology 580.

INCURABLE eyestrain 456.

INDICATIONS of the cycloplegics in determining defects of refraction 611.

INFANTILE cerebral diplegia with blindness 114.

INFECTIONS, concerning the pathway of certain post-operative 170.

INFECTION, eye; third hundred cases with bacteriological examination 566.

INFECTION of corneal wounds with sputum 469.

INFECTION, treatment of, following cataract extraction 141.

INFLAMMATION of the conjunctiva 436.

INFLAMMATION of the eyes due to infection from hay fever, conveyed by tobacco smoke, with report of cases 285.

INFLAMMATORY affection of the ciliary ganglion, associated with retrobulbar neuritis 103.

INFLUENCE of frynin on the eye 110.

INFLENZA, retro-bulbar neuritis in 489.

INJURIES, ocular, from foreign bodies 457.

INJURIES, ocular, from glass and stone 558.

INJURIES, ocular, from glass and stone 172.

INOCULATIONS of syphilitic virus into rabbits' eyes 574.

INOCULATION, vaccinal, of the conjunctiva 605.

INTERMITTANT lacrimation caused by the esophago-lacrimal reflex, in a case of facial paralysis 324.

INTERNAL ocular inflammation, the treatment of, by diaphoresis 145.

INTERSTITIAL keratitis, chancre of the eyelid with 173.

INTERSTITIAL keratitis following frauma 484.

INTERSTITIAL keratitis, recurrence in 484.

INTERSTITIAL keratitis, blanching of eyelashes in 460.

INTERSTITIAL keratitis produced in the rabbit by inoculation of syphilitic virus 476.

IRIDOCYCLITIS complicating whooping cough 333.

IRIS, so-called leucosarcoma of 449.

IRIS, radial tear in 160.

OPACITIES, vitreous, in young girls 301.

OPERATION for conical cornea, a successful 563.

OPERATION for entropion, with removal of tarsus 598.

OPERATIVE, post-operative and traumatic infections of the eye, including those arising from instillations and instruments 537.

OPHTHALMIA, ante-partum 437.

OPHTHALMIC practice, argyrol in 106.

OPHTHALMITIS, bilateral metastatic 343.

OPHTHALMIA, concerning the prevention of, by Sophol 469.

OPHTHALMIC practice, modern 452.

OPHTHALMIC news, items and announcements 196.

OPHTHALMIC outfit for bedside examination 151.

OPHTHALMOLOGICAL Society of the United Kingdom 134—136.

OPHTHALMOLOGICAL Society of the United Kingdom 428.

OPHTHALMITIS, metastatic 155.

OPHTHALMITIS, sympathetic, after panophthalmitis 443.

OPHTHALMIA neonatorum as a cause of blindness in Mexico. The importance of its prevention by publishing its dangers among doctors, midwives and the public 607.

OPHTHALMOLOGY, work of the section on, of the American Medical Association 441.

OPHTHALMOLOGY, stasis-hypermia in 468.

OPHTHALMOLOGY, yellow glasses in 490.

OPHTHALMOMETRIC measurements of corneal curve 131.

OPHTHALMOSCOPE and how to use it 195.

OPTIC nerve atrophy 343.

OPTIC nerve atrophy following erysipelas 489.

OPTIC NEURITIS, a case of hereditary, (Leber), of legal interest 478.

OPTIC neuritis and retinitis, uniocular 440.

ORA serrata, excresences of 485.

ORBITAL thrombophlebitis, thrombosis of the cavernous sinus following 559.

ORBITAL endothelioma, a case of 558.

ORBIT, a case of pseudolucemic tumor of 467.

ORBITAL abscess, two cases of 340.

ORBIT, sarcoma of, with conservative operation 484.

ORBIT, dermoids of 433.

ORBIT, gun-shot wound of 139.

ORBIT, osteoma of, following nasal fracture 483.

ORBITAL sarcoma: with report 118.

OSTEOMA of orbit following nasal fracture 483.

OSTEO-PERIOSTITIS and sinusitis following diphtheria 596.

OTITIS MEDIA, ocular paralysis in 602.

PANOPHTHALMITIS, sympathetic ophthalmitis after 443.

PAPILLOMA of the conjunctiva 144.

PAPILLOMA of the lacrimal caruncle 143.

PARALYSIS of upward movement 603.

PARALYSIS of the upward movement of both eyes 147.

PARALYSIS, myasthenic: (bulbar paralysis without anatomical findings) 318.

PARAFFIN plates in the treatment of symblepharon 454.

PARALYTIC strabismus from fracture of the sphenoid bone 118.

PARENCHYMATOUS keratitis, the treatment of, by Hetol 584.

PARINAUD'S conjunctivitis 305.

PARINAUD'S conjunctivitis, a contribution to 308.

PARTIAL congenital stationary cataract 428.

"PASSIVE hyperemia," the application of Bier's, treatment to diseases of the eye 311.

PERSISTENT hyaloid canal, a case of double 177.

PERFORATION, double, of the sclera 143.

PERIL, a yellow 300.

PERSISTENT hyaloid artery, both eyes. Unusual variety, left eye 355.
PERSISTENT hyaloid artery in both eyes. Unusual variety in one eye 201.
PHYSICIANS' visiting list 194.
PIGMENTARY degeneration of the retina 344.
PIGMENT naevus of the chorioid 578.
PIGMENTATION of the retina of the optico ciliary neurectomy in man 567.
PIGMENTARY atrophy of the retina, concerning the nature of simple 586.
PNEUMOCOCCUS conjunctivitis 191.
POST-DIPHTHERITIC paralysis, sero-therapy in 603.
POSTERIOR sclerotomy as a preliminary to iridectomy in acute glaucoma 562.
POISONING by homatropin 445.
PRELIMINARY note on enucleation of eyeball under local anesthesia 543.
PREVALENT diseases of the eye 623.
PREVALENT diseases of the eye, reference, handbook on 623.
PROBABLE bilateral obstruction to the central artery 192.
PROGRESS of a year in the recognition of eyestrain reflexes 393.
PSEUDOLUCEMIC tumor of the orbit 467.
PTERYGIUM 444.
PUPILLARY inaction as observed in the hysterical paroxysm 314.
PUPILLARY inaction, traumatic 308.
PUPILLARY reflexes in general paralysis 490.
PUPILOMETER, a binocular 467.
PUPIL, influence of the size of, in skiascopy and a pupil stop 443.
PUPIL reflex, lid-closure 459.
PURULENT inflammation of the frontal sinus, simulating disease of the lacrimal sac 151.
PYEMIA, orbital cellulitis and death, following the use of mesotan 230.
RADIAL tear in the iris 160.
RADIO-THERAPY in Basedow's disease 481.
RAILWAY service, advantages and disadvantages of glasses in 297.
RECURRENCES in interstitial keratitis 484.
REFLEXES, pupillary, in general paralysis 490.
REGULATION of color signals in marine and naval service 463.
REFRACTION, unusual changes in 152.
RELATIONSHIP between abnomal ocular phenomena and symptoms in the distribution of the vagus 335.
REMOVAL of the lens in high myopia 345.
'REPORT of a case of homatropin poisoning 237.
REPORT of a case of primary tuberculosis of the conjunctiva 76.
REPORT on the progress of ophthalmology in the year 1905 13.
RESTORATION of socket for for carrying an artificial eye 112.
RETRACTION of the levators 599.
RETINA, monocular visible spasm of the central artery of 565.
RETINA, gleonia of, reports of four cases 561.
RETRO-OCULAR neuritis 116.
RETINITIS proliferans 349.
RETINAL artery, embolism of the central 346.
RETAINED hyaloid artery 344.
RETINA, pigmentary degeneration of 344.
RETINAL vein, thrombosis of the central 320.
RETRO-BULBAR, neuritis in influenza 489.
RETINAL arteries, the treatment of recent embolism of, by digital massage 295.
RETINAL artery, spasm of, and its relation to transient blindness 438.
ROENTGEN treatment of leprosy 126.
ROTATIONS, ocular 452.

RUPTURES, concerning isolated, of Decemet's membrane 472.

SARCOMA of the eye, a case of, involving chiefly the ciliary body 122.

SARCOMA of orbit with conservative operation 484.

SARCOMA, orbital: with report of a case and a discussion of radical operation, X-ray therapy, and electro-chemical sterilization 118.

SARCOMA of the chorioid, three cases of, and one of glioma of the retina 148.

SCLEROSIS of the cornea 477.

SCLEROSIS, a case of chorioidoretinal with spontaneous dislocation of the lenses, partial and complete 354.

SCLEROSIS, the early symptoms of insular 115.

SCLEROTOMY, posterior, as a preliminary to iridectomy in acute glaucoma 562.

SCOPOLAMIN and morphin anesthesia in ophthalmic surgery 65.

SECONDARY glaucoma 183.

SECTION on ophthalmology—College of Physicians of Philadelphia 138.

SECTION on ophthalmology—College of Physicians of Philadelphia 612.

SENILE cataract, iridectomy in the extraction of 608.

SENILE cataract, a study of the nativity, sex and age, occupation and social condition of 3436 cases of, operated upon at the Wills Hospital in Philadelphia 549.

SEPTIC thrombosis of cavernous sinus 134.

SERO-THERAPY in post-diphtheritic paralysis 603.

SERPENT ulcer, bacteriology of 459.

SERUM treatment of exophthalmic goiter 101.

SERUM treatment of throidism 448.

SILVER salts, the use of the newer, compared with nitrate of silver 188.

SIMULATION in strabismus 600.

SIMULTANEOUS contrast color-images 139.

SIMULATED defective vision, the detection of one-sided 311.

SUTURE, a secure, looped, single-stitched advancement, with a consideration of scleral anchorage 563.

BRITISH Medical Association—74th annual meeting, Toronto, Aug. 21, 22, 23, 24 and 25, 1906 337.

SOCIETY proceedings—Section on Ophthalmology, College of Physicians of Philadelphia 612.

SO-CALLED leucosarcoma of the iris 449.

SOME cases of associated coloboma oculi and arteria hyaloidea persistens 359.

SOME cellular changes in the primary optic vesicles of necturus 32.

SOME lesions of high myopia 164.

SPECIFIC hyalitis 568.

SPONTANEOUS dislocation of the eyeball 165.

SPONTANEOUS hemorrhage into the orbit in women 595.

SPONTANEOUS luxation of the transparent lens into the anterior chamber 488.

SQUINT, causes, pathology and treatment 195.

SQUINT, convergent 431.

STASIS-HYPEREMIA in ophthalmology 468.

STOVAIN as a local anesthetic 317.

STRABISMUS, simulation in 600.

STAINING methods for eye bacteria 430.

STATIONARY cataract, partial congenital 428.

STEEL alloys which are not magnetic 428.

STEEL, extraction of, from the lens 191.

STRABISMUS, paralytic, from fracture of the sphenoid bone 118.

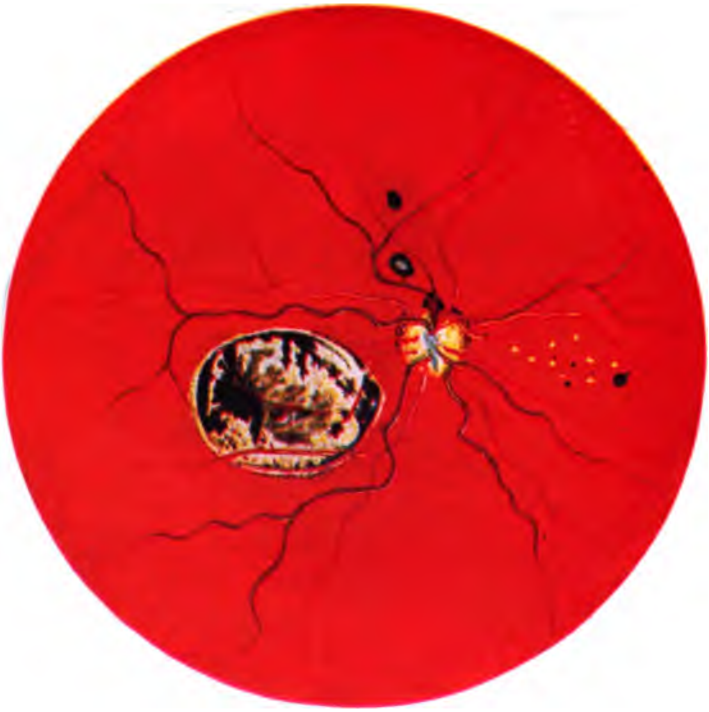
SUBDIVISIONS of the visual cortex with remarks on cortical color centers 161.

SUPPRESSION of aqueous secretion 465.

SURGICAL operation or radiotherapy in lid epitheliomata 481.

SURGICAL treatment of exophthalmic goiter 456.
SURGICAL treatment of goiter 103.
SYMBLEPHERON paraffin plates in the treatment of 454.
SYMPATHETIC influence following wounds 133.
SYMPATHECTOMY in glaucoma 319.
SYPHILITIC eye diseases, diagnosis and treatment of 610.
SYPHILITIC virus, inoculations of, into rabbits 'eyes 574.
SYMPTOMS of ametropia 178.
TEACHING regarding myopia, the foundation of 592.
TEAR ducts, etiology and treatment of diseases of the 609.
TEST types, some new 124.
TENONITIS, a case of metastatic suppurative 323.
TEST methods, Howe's resolution on 433.
TEST types, another set of 594.
TETANUS, cephalic, following a contusion wound of the outer canthus 113.
THE American Illustrated Medical Dictionary 622.
THE Bier-Klapp suction appliance as a substitute for the heurteloup apparatus 584.
THE crystalline lens in health and in cataract 39.
THE diagnosis of trachoma 335.
THE detection of one-sided simulated defective vision 311.
THE doctrine of immunity in ophthalmology 580.
THE early symptoms of insular sclerosis 115.
THE effects of "full" and of "minimum" doses of atropine sulphate and of homatropine hydrobromate 565.
THE establishment of a filtrating cicatrix in chronic glaucoma 488.
THE etiology and genesis of hole formation in the macula lutea (retinitis atrophican centralis, Kuhnt) 589.
THE eye and the nervous system; their diagnostic relations; by various authors 616.
THE geographical distribution of trachoma in Hungary 593.
THE "exaggeration" and hobbyriding of the eyestrain theorist 85.
THE knowledge of lymphangioma orbitae 259.
THE late change in specific chorioido-retinitis 491.
THE old and the new in ocular therapeutics 569.
THE operation for cataract 302.
THE operative treatment of lamellar cataract 329.
THE ophthalmic sins of hospitals 369.
THE ophthalmoscope and how to use it 195.
THE pathogenic bacteria of the eyeball 451.
THE pathology of the eye 194.
THE relationship between abnormal ocular phenomena and symptoms in the distribution of the vagus 335.
THE relation of the facts of color blindness to the psychophysical theory 105.
THE science of paradoxic lidmotion 248.
THE significance of the eye-symptoms in disseminated sclerosis of the brain and spinal cord 115.
THE surface and vessels of the iris 590.
THE surgical treatment of trachoma 526.
THE therapeutic application of the X-ray in disease of the eye 518.
THE therapeutics of guaiacol in ophthalmology 576.
THE treatment of detachment of the retina 135.
THE treatment of internal ocular inflammation by diaphoresis 145.
THE value of recognition of errors of refraction in functional diseases of the nervous system 119.
THROMBOSIS of the cavernous sinus following orbital thrombophlebitis 559.
THROMBOSIS of the central retinal vein 320.
THYROIDISM, the serum treatment of 448.
TRACHOMA in a negro 188.
TRACHOMA, the diagnosis of 335.

TRANSIENT blindness, spasm of the retinal artery and its relation to 438.
TRANSILLUMINATOR, an ocular 358.
TRANSPARENT lens removed for high myopia 159.
TRANSPARENT lens removed for high myopia 160.
TRANSPLANTATION of part of the auricular cartilage, supplement to new operative methods of restoring defects of the lid by means of 310.
TRAUMATA, ocular 600.
TRAUMATIC aniridia 148.
TRAUMATIC detachment of the retina from the optic nerve 327.
TRAUMATIC enophthalmus 596.
TRAUMATIC pupillary inaction 308.
TRAUMATIC laceration of the interior rectus muscles 561.
TREATMENT of infection following cataract extraction 141.
TREATMENT of myopia 587.
TRIANGULAR opacities in the superficial layers of the cornea 175.
TUBERCULOSIS, ocular 606.
TUBERCULOSIS of the choroid 572.
TUBERCULOSIS of the choroid 486.
TUBERCULOSIS of the conjunctiva 458.
TUBERCULAR keratitis 175.
TUBERCULOSIS, miliary 429.
TUBULAR growth, congenital 187.
TUMOR of the fundus, a benign stationary 332.
TUMOR, the resolution of choked disk in 334.
TUMOR, dermoid, of the bulbar conjunctiva 159.
TUMORS of the lachrymal sac 598.
TUMORS, differential diagnosis of, of the Uveal tract 448.
ULCERATION, corneal, due to the diplobacillus 320.
UNILATERAL exophthalmos of traumatic origin 356.
UNILATERAL retrobulbar neuritis in recurring empyema of the antrum. The relation of nasal disease to ocular affections 474.
UNIOCULAR optic neuritis and retinitis 440.
UNNECESSARY blindness 458.
UNUSUAL changes in refraction 152.
UNUSUAL fundus conditions 108.
UNUSUAL success from iridotomy in eyes practically blind from complicated cataract 351.
UPWARD movement, paralysis of 603.
UVEAL tract, differential diagnosis of tumors of the 448.
VACCINAL inoculation of the conjunctiva 605.
VACCINIA of the eye 312.
VEINS, choris-vaginal 438.
VISUAL cortex, subdivisions of, with remarks on cortical color centers 161.
VISUAL test-types, illumination of 431.
VITREOUS opacities in young girls 301.
VOMITING in school children, astigmatism, a cause of 121.
V-SHAPED iridotomy: Knife-needle vs. Scissors 351.
WHOOPING COUGH, iridocyclitis complicating 333.
WOUNDS, sympathetic influence following 133.
X-RAY applications, protection of the eyeball during 481.
YELLOW glasses in ophthalmology 490.



COLOBOMA OF THE MACULA. (Fischer)

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COLOBOMA MACULAE LUTEAE.

By Waldemar E. Fischer, M. D.,

ST. LOUIS.

LATE VOL. ASS'T. IMPERIAL ROYAL EYE CLINIC OF VIENNA.

(With a Colored Plate.)

In the past year an opportunity presented itself to observe a case of this rare and interesting congenital anomaly. To quote von Hippel there are but three dozen cases on record, of which five were bilateral.

These defects may be and often are confused with chorioiditic patches by the inexperienced. The condition is congenital, circumscribed and occupies the macular region whose boundaries it may exceed; moreover its appearance is very characteristic.

Bock quotes v. Ammon for describing anatomically a condition in the fundus of an eye affected with a coloboma of the iris resembling a coloboma of the macula lutea, in 1852. Prior to v, Ammon's observation, and even later, cases belonging to this category were not properly understood, which is proven by plate 92 of Edward v. Jaeger's unexcelled atlas, in which he unquestionably illustrates a case of coloboma maculae luteae, but interprets it as a rare chorioidal change. Streatfield's case, published in 1866, heads the list of all those recounted to the present time.

The table compiled by Bock has been appended on account of its completeness.

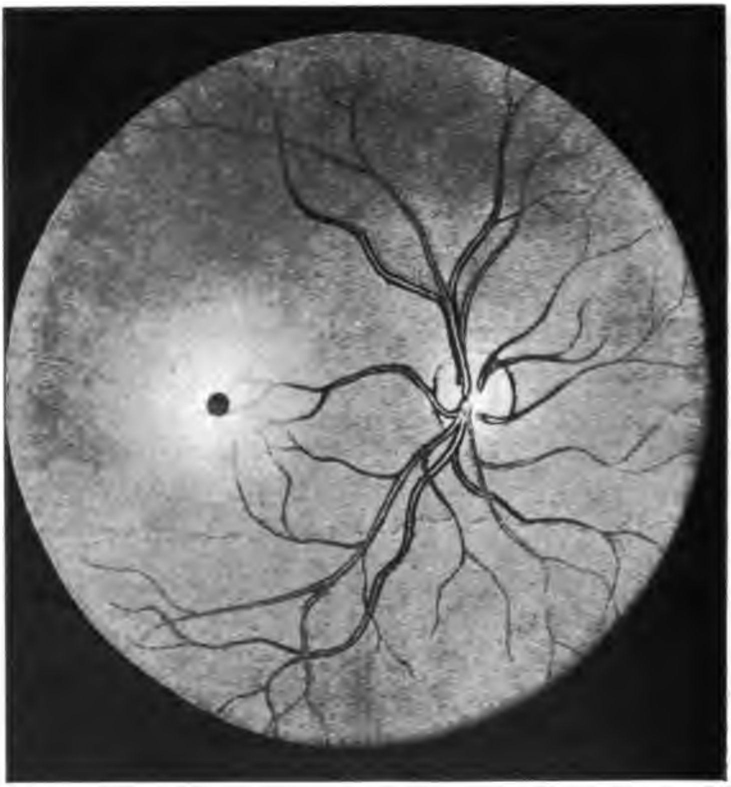
Miss S. W., aet. 15, born in Harrodsburg, Ky., was brought to me in October, 1904, on account of a convergent squint, which developed during the third week after her birth. The patient is the second child in a family of five children, who all have normal eyes.

An external examination of the eyes reveals a concomitant convergent strabismus and a chronic papillary conjunctivitis.

Van Duyse: Ann. d'Ocul. 98. p. 108.
Bock: Allegm. Wiener. Medic. Zeitung. 1888.
Silex: Arch. f. Augenheilkunde. XVIII. p. 289.
Dor: Centralbl. f. Augenheilkunde. 1899. Mach.
Bock: Bericht ueber das Jahr., etc. Laibach, 1889, p. 27.
Michaelsen: Centralblatt. f. Augenheilkunde, 1889, p. 108.
Hess: Graefe's Arch. XXXVI. 1 p. 135.
Johnson: Arch. f. Augenheilkunde. XXI. p. 291.
Deyl: Ber. Uber d. Intern. Congr. in Moskau. 1897.
Kimpel: Arch. f. Aukenheilk. XXXVII. 1 p. 45.
Kastalsky: Arch. f. Augenheilk. XXXVI. p. 59.
Van Duyse: Arch. d'Ophtalm. XIX.

Author	Situation of Coloboma	DESCRIPTION OF THE COLOBOMA	Refraction	Visual Acuity	Visual Field	Remarks
Streatfield 1866	Region of the Macula Lutea.	Glittering ecasia 4 papillary diameters in size. Ciliary vessels enter Coloboma from the Sclera, ringlike staphyloma posticum.	Highest degree of myopia. M.	Jaeger No. 16.		
v. Jaeger 1869	Macula.	Horizontal ellipse, white, surrounded by pigment. Many vascular loops in its vicinity.	E.			Male, aet. 51
Talko 1870	A little below and outward from the papilla.	Pearlike, 3 papilla diameters in size, white, glittering like mother of pearl. Retinal vessels bound the lower boundary only.	High. M.	√ 1-5		
v. Wecker 1870	Macula.	4 papilla diameters in size, excavation 2 mm. deep	Ht. 1·86	Amblyopia.		Both eyes,
Schweigger 1871	Macu'a.	1.5 to 2 papilla diameters in size, excavated, light. Pigment at the border and the region of the defect. conus.	M.			
Montmeja 1872	Between papilla and Macula.	Triangular, with base turned toward the papilla, 1 papilla diameter long, ectatic, much pigment at border, little in the interior.	H. Moderate degree	√ 1		Irideremia compl. oc. Utqu.
Reich, 1872	Macula.	Rhombic, white, lustrous without vessels.	Mixed astigmatism.	√ 1	No defect.	Other eye normal.
Hirschberg 1875	Macula.	Light blue, slightly excavated, well vasculalized, 8 times as large as the papilla including the conus.			Central Scotoma	
Jodko, 1876	Above the Macula	White lustrous spot.				
Schnabel 1876	Macula.	Elliptical, 4½ papilla diameters in width, 8 papilla diameters high, excavation 2 mm. deep. Retina continued beyond borders as a thin silk veil.	Papilla E. Coloboma M. ⅙.		Central defect.	
v. Wecker 1876	Macula.	White, 3 times the size of the papilla, large staphyloma outward.	M. ⅙	Counts fingers in 1½ feet.		Left eye M. ⅙ V 2-7
v. Wecker, 1877	Macula.	Ectasia sclerae.				2 cases.
Schmidt-Rimpler, 1880	Macula.		R. E. H. 12 S. E. H. 11	R. E. 5-6 L. E. 1-6	No scotoma.	Both eyes.
Fuchs, 1882	Macula.	5 papilla diameters in size, conus downward.			No scotoma.	Both eyes.
Fuchs, 1882	Macula.	White disc with pigment spots over which retinal vessels extend.		√ V Normal	No scotoma.	
Van Duyse 1884	Macula.	Triangular, yellowish white, excavated, surrounded by pigment.			Temporal half of visual field absent.	
Schnabel 1884	Region of the Macula.	Elliptical, not excavated, surrounded by a yellow border, a few chorioidal vessels.	M. 8 D.		Central scotoma	

Author	Situation of Coloboma	DESCRIPTION OF THE COLOBOMA	Refraction	Visual Acuity	Visual Field	Remarks
Schnabel, 1884	Region of the Macula	Washbasin like, excavated 2 D.	M. 1 D.		Central scotoma	
Schnabel 1884	Region of the Macula.	¼ of the optic disc in size, round with yellow border.	H.		Central scotoma	
Schnabel 1884	Region of the Macula.	Elliptical, excavated, pigmented. A large atrophic spot upward and outward from the optic disc.	M. 14 D.		Central scotoma	
Wiethe 1884	Macula.	Large round defect with steep walls. Chorioiditis disseminata.	Extreme M.			
Birnbacher 1885	Macula.			V 6-36	No scotoma.	
Nuel, 1885	Macula.	Deep. Surrounded by pigment. Vessels are about and traverse the defect in which there is a loop of a chorioidal vessel.	Extreme M.		Blind spot 18° in extent.	Fellow eye shows slight myopia.
Van Duyse 1886	Macula.	Horizontal, oval, well defined, deeply excavated. In periphery atypical spots in chorioid.		Amblyopia	Relative central scotoma.	
Bock, 1888	Macula.		Low degree M.	$V\frac{20}{70}$ with $\frac{1}{18}=\frac{20}{20}$	Central scotoma	Fellow eye $V\frac{20}{50}$ with 1-36 $V\frac{20}{20}$
Silex, 1888	Macula.	Two gray blue spots showing size of optic disc beneath the horizontal oval defect, which is crossed by a retinal vessel.		Fingers counted at 1 meter.		Fellow eye normal.
Silex, 1888	Macula.	Glistening white, large pigment spots. A retinal vessel traverses the defect.	Ht. 4 D.	V 1-36		Fellow eye normal.
Dor, 1888	Macula.	Pigment spots of chorioid on nasal side of optic disc; coloboma vaginae nervi optici.				Microcephalus.
Bock, 1889	Macula.			Scotoma.		
Michaelsen 1889	Macula.	Separated from the papilla by atrophic chorioid. Retinal vessels are to be found in the defect. Micropthalmus, membrana pupillaris persistens; coloboma vaginae nervi optici.				
Lawson, 1890	Macula.	Oval, horizontal, large similar formation inward and outward.	$S\frac{16}{18}$			
Johnson, 1890		13 cases of extra papillary colobomata in different situations.				
Bock, 1889	Macula.			Low degree M.	Amblyopia.	



Fundus Oculi in Amaurotic Family Idiocy.
(Dr. Mortimer Frank's Case).

A CASE OF AMAUROTIC FAMILY IDIOCY, WITH AN APPENDIX OF REPORTED CASES.

By Mortimer Frank, M. D., B. S. (Mass. Inst. Tech.),

CHICAGO.

(With One Plate).

This uncommon disease is especially interesting to ophthalmologists because of the fundus changes which are pathognomonic, and because Waren Tay, an English oculist, first drew attention to the subject in 1881. From that time until 1896, when Sachs proposed the name as now used, each observer described his case under a different title.

Amaurotic family idiocy is a fatal disease, commencing in the early months of infant life with muscular weakness progressing to almost complete paralysis, associated with a distinct symmetrical fundus appearance, and terminating in death about the end of the second year. No definite existing cause has been assigned. There is no evidence that inherited syphilis, consanguinity of parents or any of the usual diatheses is a factor. There is, however, a marked racial peculiarity. In but six of all the recorded cases the disease has occurred in Jewish children. Both male and female children are affected. There is a suggestive family predisposition, in that more than one child in the same family is attacked, but with no regularity in the order in which this takes place.

The child is born at full term, sound and healthy, and continues so until about the third month. It then ceases to develop along normal lines and signs of muscular enfeeblement, especially of the back and neck, are observed, with failure of sight. Should an ophthalmoscopic examination be made at this time, definite and characteristic changes in and about the macular region will be detected. Marasmus increases slowly, and the muscular enfeeblement becomes so pronounced that the child is unable to sit up and the head falls backward if unsupported. The grasp is feeble, and objects placed in the hands are soon dropped. There is a decided cessation of mental development, and the child becomes apathetic. Perception of light is present for a time, while hearing remains hyperacute, so much so that any sound causes the child to start.* The sense of taste is preserved, and interference with deglutition occasionally happens. Finally, paresis or paralysis, either flaccid or spastic, of the greater part of the body appears. The deep reflexes may be exaggerated or diminished, and occasional spasmodic contraction occurs. The temperature is normal throughout the course of the disease. Falkenheim calls attention to an explosive laughter. Total blindness finally ensues from optic atrophy. The duration of life varies from one and a half to two and a half years.

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*Kingdon observed the changes in the temporo-sphenoidal lobe much less marked than in other regions of the brain, which probably explains the fact that hearing is unaffected.

The following case was referred to me by Dr. A. C. Cotton, through whose courtesy I am enabled to publish it. Minute details are omitted, as the history will be more fully gone into when published by him.

R. H., female, aged one year, was examined March 27, 1905. She is the youngest of four children, the remaining being boys in good health. There is a history of one miscarriage. All the children have been breast-fed. The parents are of Jewish extraction, with no history of consanguinity or syphilis. The appearance and nutrition of the child were good, and the head was well-formed and of normal size. She was listless, unable to sit up, and apathetic and understood nothing. The reflexes were exaggerated, and especially noticeable was the abnormal susceptibility of the child to noises.

With reference to the ocular symptoms, the following was noticed: The pupils were about 1½ millimeters in diameter, equal in size, and reacted slowly to light. Light thrown into the eyes failed to give any evidence of vision. A drop of atropin solution was put into each eye to facilitate the examination. The discs were atrophic, greyish in color, and the outlines well-marked. The retinal vessels were of normal size. The fundus picture, as described elsewhere, was typical of the disease.

The ocular symptoms are pathognomonic of the disease and are present early. In the beginning there is no change in the appearance of the discs and the child is able to see. Later on there is definite optic atrophy and total amaurosis. Optic neuritis has been observed to precede optic atrophy. The changes at the macula are characteristic and unique and always symmetrical. These changes remain unaltered throughout the course of the disease. About the macula is a nebulous area, greyish-white in color, slightly raised above the surface of the retina, and about two to three times the size of the optic disc, with softened edges gradually blending with the normal fundus. The patch is somewhat oval in shape, with the major axis horizontal. In its center, coinciding with the fovea centralis, but larger, is a dark red, or liver-colored, spot, clear-cut in outline. Surrounding the central spot can be seen distinctly the tiny retinal vessels. Strabismus and nystagmus have been observed in some cases. There is no recorded regularity as to the condition of the pupils.

In but six cases have the eyes been studied microscopically. Treacher Collins reported the first findings in Kingdon's two cases. He found the retina much thickened at the yellow spot due to enlargement of the outer molecular layer, the tissue of which showed a spacing-out which he regarded as indicative of edema. The most marked changes occurred in the neighborhood of the fovea and became less evident towards the periphery of the affected area. The retina was detached from the chorioid, and had been thrown up in folds above the macular region, probably due to faulty fixation with Mueller's fluid. The optic nerve was atrophied, with increase of interstitial connective tissue and a large increase of round cells. At the time of this examination no study had been made of the ganglion cells.

In the third case, examined by Ward Holden, the results were unsatisfactory, owing to the advanced post-mortem changes.

In the fourth case, that of Hirsch, also examined by Holden, he reported the essential changes in the eye to be degeneration of the ganglion cells of the retina, and of the nerve fibers of the optic nerve and tracts.

In the fifth case, that of Mohr, examined by Preisz, he reported edema and thickening of the outer molecular layers, especially the fiber layer of Henle, which composes the outer portion of this layer in the region of the macula. This edema is ascribed to a probable angioneurotic disturbance, the result of pathological alterations in the cervical cord. No mention is made of the condition of the ganglionic cells. The outer segments of the rods and cones were degenerated and the formation of a granular substance found between the external limiting membrane and the chorioid.

Holden was the first to show the relationship between the fundus changes, especially at the macula, to those found in the central nervous system. He likewise regards the atrophy of the optic nerve both as an ascending and a descending degeneration, and dependent on a common cause and related to the changes in the cerebral nervous system, as both are embryologically related.

In the sixth case, that of McKee, examined by Shumway and Buchanan, the views of Holden were confirmed.

The nebulous area about the macula it is reasonable to suppose results from the swollen and degenerated ganglion cells present in larger numbers in the macular region rather than to an edema.

Two facts speak against edema; first, the unchanging appearance of the lesion for months, and the absence of any veiling of the minutest vessels in this area (Falkenheim).

In the fovea the ganglion cells are absent, but at the margin of the fovea the ganglionic layer is six to ten cells deep, gradually growing less until at the periphery it is only a layer of single cells. Thus we have the red center void of cells next the dense white corresponding to the deepest portion of the layer fading away gradually as the cells become fewer. In the vertical meridian the ganglion cell layer thins out more rapidly than in the horizontal, explaining the oval area about the macula having its major axis horizontal.

Sachs, in his last paper (*Journ. Ment. and Nerv. Dis.* Jan., 1903, p. 1), lays great stress on the morbid process in this disease affecting primarily or at least to a great extent the layer of ganglion cells of the entire gray matter of the brain, and of the spinal cord. These confirmed the cellular findings previously described by Hirsch (*Journ. Ment. and Nerv. Dis.* 1898, p. 538), and recently by Spiller (*Amer. Jour. Med. Sciences,* Jan., 1905, p. 45).

A BRIEF SUMMATION OF THE INTERRELATIONSHIP OF BINOCULAR FIELDS OF COLOR VISION AND COMBINED AREAS OF ASTIGMIA.

By Charles A. Oliver, A. M., M. D.,

Philadelphia, Pa., U. S. A.

In the years 1900 and 1901, the writer, through the suggestion of Dr. S. Weir Mitchell and with his kind collaboration, made a series of experimental studies respecting a number of remarkably interesting color-changes which were due particularly to what is known as "oblique" and "against the rule" types of astigmia.

A second article upon the subject from a standpoint of normal and subnormal color perception was read before the Section of Ophthalmology of the College of Physicians of Philadelphia, and appeared in the *American Journal of the Medical Sciences.*

The present paper, which is a correlation of the other two, has to deal with dual impressions. Apparently complex at first sight, and filled with most bizarre and curious findings as to the most intricate types of subjective coloration and related astigmia, it has been of intense interest to the writer to endeavor to interpret the many paradoxical and at first glance, apparently conflicting results.

The two eyes, especially those which had been proved to possess unusual meridians of faulty curvature in the medial surfaces and peculiar kinds of, axial astigmia were tried at one time. Improvised, but sufficiently adequate forms of stereoscopic instrumentation, through which the subjects were made to binocularly gaze upon two fixed contrivances** in which both equalized and known relatively differing degrees of revolution of complimentarily tinted bands made at known rates of speed, were employed.

The summation of the experiments, proved conclusively that there is a direct relationship between the several physical factors at work: that is; the degrees and the kinds of resident astigmia, the character and the peculiarity of complementation of the exposed tints, the nature of the illuminant under which the work is done, and the general and mental conditions of the experimented subject.

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*This work which has been collated into a brief paper expressive of the findings alone, will be presented to the Fifteenth Annual International Congress of Medicine which is to meet at Lisbon, Portugal, in April, 1906. (A previous communication upon the subject in every detail was read before another association, but was never published.)

**Kindly constructed for the writer by Messrs. Wall and Ochs, of Philadelphia, Pa., U. S. A.

The rules determined were: I. Subjects with midgrades of symmetrical, oblique astigmia of both axial and meridianal types, when binocularly working, are the ones who in the higher grades of mentality, are able to provoke simultaneous contrast colorations of subjective types up to the tertiary and even to the quaternary color compounds of complementary tints, which are so positive and are so well defined, that in not a few instances, the color-changes become for both the detection of the kind and the amount of astigmia and the value of color vision, of immense diagnostic value: II. Among subjects with the simpler types of binocularly expressed axial and meridianal astigma—in which ofttimes there is an absolute corrective influence over the monocular faults, the lessening and even the cessation of the subjective color changes, not infrequently give direct answers why many cases of minor degrees of astigmia see properly at the expense of the fusional centers; and III. In some subjects who are the possessors of irregular axial and meridianal astigmia, and in all subjects with so-called medial astigmia, the characters of the astigmic conditions are frequently at once known by the peculiarities of the coarse plays of color change, which in the worst cases are almost kaleidioscopic in character.

REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE YEAR 1905.*

BY JOHN GREEN, JR., M. D.,

ST. LOUIS.

It may not be out of place to preface this Review by a word on a curious phase in the evolution of this branch of medical science. From the time of the discovery of the ophthalmoscope the tendency of ophthalmology has been toward isolation. Instead of fitting snugly into the great mosaic of the medical branches, contiguous to neurology, internal medicine, rhinology, etc., it has evinced an unfortunate exclusiveness, occupying a little place apart. This arose in great part, from the difference between certain of the problems of opthalmology and those of other branches of medicine. It is difficult for instance, to see any connecting link between the problems of optics and those, let us say, of internal medicine. Thus ophthalmic practitioners came to look upon an eye very much as dentists look upon a tooth—as being in the body but not an integral part thereof. In their daily practice they encountered so much that seemed satisfactorily explainable on a purely ophthalmic basis that they forgot or perhaps never realized the often scarce tangible but none the less real dependence of ocular defects on abnormal conditions of the economy. As the result of always directing the mental vision upon a plane surface they lost all sense of proportion and perspective.

That this unfortunate state of mind has wrought much harm can hardly be controverted. The man who has no sense of perspective is incapable of maintaining that openness of mind and freedom from prejudice indispensable to a scientific worker. If he develops an idea it inevitably undergoes hypertrophy. Is not the present hysteria on the subject of eye-strain the natural result of viewing the medical world through a tube? Is not dogmatic assertion the weapon of offense of the egoist with an obsession? Let those who decry achievements in other branches of medicine in the mad desire to establish a pet theory remember that Truth is a shy maiden and cannot be won with the alarums of the battlefield.

Happily, the signs are not wanting that a change is coming over the spirit of the ophthalmic world. The former disregard of general methods is being replaced by a deep appreciation of the value of the widest possible view. Thus will ophthalmology be rescued from that isolation which has prevented its proper co-ordination with other branches of medical science. And as one of the earliest consequences will come the passing of the ophthalmic bigot whose smug self sufficiency has ever been a clog in the wheel of progress.

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*Interstate Medical Journal, January, 1906.

Anatomy and Physiology.

An interesting study of the neurologia of the optic nerve has been contributed by Jacoby[1]. He found that the neuroglial fibres were thickest at the level of the lamina cribrosa. On the floor of the physiological excavation the neuroglial elements mingled with the connective tissue remains of the hyaloid artery. In the disk proper the elements were extremely attenuated. Concentrically arranged neuroglial fibres formed the intermediate tissue (Kuhnt) between the chorioidal ring and the retina which, according to the author, could be seen ophthalmoscopically as a narrow, bright strip surrounding the nerve entrance. In the retina the elements ran, for the most part, perpendicular to the course of the nerve fibres.

An important physiological contribution is Bielschowsky's[2] paper "On the origin of unilateral vertical movements of the eyes." On the basis of experiments and theoretical considerations this writer comes to the conclusion that, in addition to the cortical centres for associated ocular movements, there exist for each eye secondary motor centres independent of each other and of the will. These secondary centres can evoke unilateral vertical movements only when the influence of the cortical centres is in abeyance (sleep, narcosis) or in the absence of the fusion faculty.

As is well known, the image of a luminous point held in front of the cornea is reflected from three surfaces—the anterior surface of the cornea, the anterior and posterior capsules of the lens. The first and second are upright images, the third is an inverted image. Hess[3] has succeeded in demonstrating a third upright and a second inverted image, formed respectively by the anterior and posterior surfaces of the nucleus of the lens.

Bacteriology and Pathology.

During the year the bacteriology of the various types of conjunctivitis has engaged the attention of numerous workers. In the light of our present knowledge a pure bacteriological classification of conjunctival inflammations is still not feasible, but that such a classification will come in the near future, the trend of all recent work seems to indicate. When this has been accomplished an immense step in advance will have been taken not only from the standpoint of scientific exactness, but also from a practical view of therapeutics. For instance, it is even now well recognized that diplobacillary conjunctivitis yields with surprising rapidity to solutions of certain zinc salts which are ineffective in other types of conjunctival inflammations clinically indistinguishable. A paper which covers the ground pretty thoroughly is that of Pollack[4].

It would appear from the investigations of Bednarski[5] that the zonule of Zinn has hitherto received scant consideration from ophthalmic pathologists. At any rate the literature of the subject is very meagre. Bednarski avers that in pathological conditions the fibres are thicker, homogeneous and often exhibit hyalin degeneration. The thickening represents atrophy of the fibers.

It might well be considered a barren year that did not give birth to a new theory as to the pathogenesis of senile cataract. This year we are invited by Roemer[6] to consider that the lens becomes cataractous owing to the attack of a poisonous substance which kills its protoplasm in a way analagous to that by which a red blood corpuscle is destroyed by the process of hemolysis. As the human organism is capable of developing cytotoxic substances of the most various kinds and of increasing the amount of others already present in the blood, it is possible that, as the result of the degenerative process of old age, antibodies are set free in the blood which possess a specific affinity for a certain definite part of the lens protoplasm, and which, provided that the secretory apparatus fails to keep them away from the lens can, by uniting with corresponding receptors of the lens protoplasm, damage the cells of the lens, just as blood cells are damaged by the attachment to them of specific cytotoxins.

The problem of the pathogenesis of choked disk has been attacked by a number of workers. It would appear, in the light of our present knowledge that there is scant justification for a strict adherence to the "mechanical" theory or to the view that choked disk is the outcome of a descending inflammation. The theory of an inflammatory origin has, however, the support of the majority of facts. In a lengthy paper, Kampherstein[7] deals with the pathology and pathogenesis of choked disk in its clinical as well as pathological aspect. A histological examination of 51 eyes revealed distention of the intersheathe space in 62 per cent; no distension in 37 per cent; and inflammatory infiltration in the intersheathe space in 75 per cent. The optic nerve was normal in 10 per cent, edematous in 60 per cent, and showed inflammatory changes in 56 per cent. In 64 per cent inflammatory changes in the papilla were observed. The lamina cribrosa was pushed forward in 78 per cent. Raised pressure undoubtedly accounted for the choked disk of chronic hydrocephalus. However, the percentage of eyes in which there was neither edema of the nerve nor distension of the intersheath space was too large to warrant the acceptance of the mechanical theory as universally applicable. When meningitis was present the changes in the optic nerves and disks appeared certainly to be those of a descending neuritis. In the clinical part, the author gives a careful analysis of 200 cases of choked disk, controlled on the neurological side by such authorities as Westphal, Oppenheim, Thomsen and Remak. In this series there were 134 cases of brain tumor, 27 cases of brain syphilis, and 39 cases of other intracranial affections. In the large majority the normal pupillary reaction was preserved. It was present even in five cases of total loss of vision, two of which showed a high degree of optic atrophy. The writer also refers to a case of post-papillitic atrophy in which, after eight years of blindness, both pupils reacted to light. Allusion is made to two groups of cases recently described by Nonne[8]: the first, presenting the symptom-complex of cerebral tumor including choked disk, but terminating in recovery with atrophy of the optic nerves; the second, in which the patient dies with all the symptoms of cerebral tumor including choked disk, but in which pathological examination fails to reveal any changes in the brain or meninges.

The various factors concerned in the production, maintenance, and alterations of the intra-ocular pressure are still imperfectly understood. Much light has been thrown on the subject by Englemann's[9] careful tonometric investigations in animals and human beings. After ligature of the common carotid in rabbits the intra-ocular pressure falls on both sides, the lowering being rather greater and persisting for a longer period on the ligated side. After ligature of the external jugular vein there occurs a temporary rise in pressure on the corresponding side. In the human subject during Valsalva's experiment and muscular work, the state of the intra-ocular pressure corresponds to that of the general blood pressure, but is less marked. Intra-ocular pressure is diminished in chloroform, increased in ether narcosis. Stimulation of the sympathetic in rabbits causes a fall: resection of the sympathetic or extirpation of the superior sympathetic ganglion causes a gradual fall with subsequent rise to normal or above normal. In four humans, removal of the superior cervical ganglion (two glaucomas, two Graves' disease caused merely transitory decrease in intra-ocular pressure. Physiological variations in the width of the pupil had no effect on intra-ocular pressure. Contraction of the orbicularis causes considerable rise. In rabbits tenotomy of all the recti muscles causes a fall. Intra-ocular pressure does not vary with the rotation of the eyes provided that parallellism of the visual axes is maintained. During strong convergence pressure is increased, but accommodation disassociated from convergence has no such effect.

Vascular involvement of the cornea in trachoma varies from the invasion of a few extremely attenuated vessels barely visible with the loupe to a dense elevated fleshy mass. Very rarely the new formation partakes of the character of a pseudo-tumor.

Such a case is described by Hirschberg and Ginsberg[10]. The cornea was covered by a greyish red prominent granulation mass, hanging over the conjunctiva and flattened by the pressure of the lids. Microscopically this proved to be a pannus which, probably as the result of tuberculous contamination, had given rise to granulation tissue. Benign tumors of the fundus are sufficiently rare to warrant allusion to a case reported by Manch[11]. A greyish nodular tumor projected 4 mm. into the vitreous: this was associated with a round black area at the site of the macula. The patient was under observation seven years, during which time no change took place in the appearance of the tumor. Cysts of the pars iridica retinae is the subject of an important contribution by Oatman[12]. A serous cyst, situated on the posterior surface of the iris was found microscopically to have resulted from the separation of the layers of pigmented epithelium which form the retinal tract of the iris. The condition is therefore entirely analagous to detachment of the retina proper and is designated "detachment of the pars iridica retinae."

Deformities of the skull associated with exophthalmos and blindness has been the subject of a number of papers. Uhthoff[13] presents three cases. In the first there was marked peaked skull with neuritic atrophy of the optic nerve and blindness. In the second external hydrocephalus with pachymeningitis and optic neuritis. In the third intense internal hydrocephalus. Gross alterations in the shape of the orbits consequent upon dislocation of the cranial bones explains the pushing forward of the globes. Patry[14], in a very carefully prepared monograph, presents a study of ocular lesions in Tower Skull. The principal features are pronounced exophthalmos, frequent divergent squint and post-neuritic atrophy of the optic nerves. The dome-shaped skull, rising from the forehead and separated from the temples is characteristic. The supraorbital ridges are entirely absent. The cranial deformity, which is due to premature synostosis of the coronal and sagittal sutures, begins in earliest infancy. Relatively good vision is often maintained. Individuals thus afflicted are usually of a low order of intelligence, but there are many notable exceptions to this rule, as witness Sir Walter Scott, Humboldt and Paracelsus, all of whom had this cranial deformity in marked degree. Patry believes, with Virchow, that a meningitis is the primary cause of both the optic neuritis and the cranial deformity.

Lids.

The ordinary form of blepharospasm, namely, that evoked reflexly by conjunctival and especially by corneal irritation is usually easily and quickly cured by removal of the cause. Another type is dependent, at least in part, on refractive errors. Finally there occur, very rarely, extremely severe cases of blebe ascribed. The ulcers were round and shallow and surrounded by diffuse infiltration. It is of the utmost importance that such ulcers be differentiated bacteriologically from infections due to the pneumococcus, as the specific zinc salt treatment of the one would be without effect on the other. In this connection Erdman's[27] investigations on the resisting power of the diplobaccillus in dried secretions is of interest. He was able to inoculate Loeffler's serum with dried diplobacillary discharge and cultures therefrom were capable of infecting the conjunctiva. A rare cause of corneal ulcer is the streptothrix recently investigated by De Berardinis[28]. He reports two cases: one mild, terminating in leucoma, the other severe ending in panophthalmitis. It seems possible that streptothrix ulcers have remained undiscovered or have been ascribed to diplococci owing to the loss of the typical branched appearance in unsuitable media. He advises cultivation on blood serum. Injuries to infants' eyes from pressure of obstetrical forceps have been alluded to in a former Review. Cases of traumatic keratitis in the new-born have been reported by Stephenson[29] and Fejer[30]. In this connection it may be interesting to refer to the classification of Thomsen and Buchanan who describe three forms of traumatic keratitis in the new-born (1)—Diffuse temporary opacity (due to edema) (2)—Diffuse permanent opacity (edema followed by inflammation or detachment of Descemet's membrane) (3)—Permanent linear opacity (linear rupture of the posterior elastic lamina of the cornea with subsequent formation of cicatrical tissue.)

Iris and Ciliary Body.

The occasional development of iritis in the course of a gonorrheal urethritis has led to the pretty generally accepted belief in a relationship between the two of cause and effect. This view has been vigorously attacked by De Lapersonne[31] who contends that the case for a gonorrheal iritis must at least be considered "not proved." Campbell[32] describes three cases of iritis, without history of syphilis or rheumatism, but associated with pyorrhea alveolaris. Treatment with mydriatics was ineffective until combined with treatment directed to the oral disease.

The peculiar expression of the eyes of tabetics is due to several factors, namely, miosis, slight enophthalmos, narrowing of the palpebral fissue and, an absence of the light-reaction of the pupil. In addition Dupuy-Dutemps[33] notes the change in the appearance of the iris, loss of the normal prominences of the anterior surface so that the iris appears practically devoid of all relief. The deformity of the pupils so frequently observed is due to partial atrophic changes in the iris; that portion of the pupillary border corresponding to the atrophic zone is that which has the greater radius of curvature. Histological examination of one case showed simple atrophy of the iris fibers.

Lens.

The subject of artificial maturation of the cataractous lens is an important one and deserves rather freer discussion than has recently been accorded it. The patience of surgeon and sufferer alike is apt to be exhausted by the postponement of extraction for months and years or until the lenticular condition has reached by natural processes that degree of maturity which experience has shown yields the highest percentage of clean and satisfactory operations. Stroking of the cornea against the lens after preliminary iridectomy is praised by McHardy[84] in no measured terms. A new method, based on the observation that cataract frequently develops in eyes exposed to great heat, has been published by Wolfberg[85]. By means of an apparatus he directs a current of hot air at 70° C. upon the eye for a short time several times daily. He has used the method three times after discission of the lens in myopia and three times after iridectomy preliminary to the extraction of the lens in senile cataract. The time required to attain ripening was about eight days. The "non-operative cure of cataract" is a title suggestive of a brochure issued by the manufacturers of that great "resolvent" of cataract "Cineraria Maratima." But that is precisely the subject discussed by one of the most eminent French ophthalmologists—De Wecker. The revival of interest in this subject must be largely ascribed to Verdereau of Barcelona who reports astonishing improvement in vision after a course of subconjunctival injections of potassium iodid. This work is still too newly fresh to warrant critical comment and to the best of the reviewer's knowledge has not been confirmed. Ossification of the lens is described in two cases by Roure[86]. The surface consisted of a thin, hard yellowish layer and the interior of a white substance exactly resembling chalk which chemically consisted of carbonates and phosphates. Throughout the lens bone corpuscles were found in abundance.

Vitreous.

The role, if any, played by the vitreous in idopathic and myopic detachments of the retina is a question that is still undecided. Best[87] has observed a slight peripheral displacement of the vitreous with each movement of the eye, this shifting being immediately followed by readjustment and believes he has found an explanation for idiopathic detachment. Elschnig, on the contrary, as the result of a microscopic examination of 17 eyes with myopia from 2 to 30 dioptres, and of 5 eyes with posterior staphyloma or with coloboma of the optic nerve, concludes that true detachment of the vitreous is rare and he is therefore opposed to the theory that vitreous detachment is the usual precursor of detachment of the retina.

Retina and Optic Nerve.

That curious disease—amaurotic family idiocy—has engaged the attention of several writers, notably Eliasberg[38] Poynton and Parsons[39] and McKee, Buchanan and Shumway[40]. A histological examination by Shumway confirms Holden's view that the essential changes in the eye are degeneration of the ganglion cells of the retina and of the nerve fibers of the optic nerves and tracts. The consensus of opinion seems to be that the condition is a true degenerative one. In these cases there is always present an inherited essential failure of vitality—the so-called "abiotrophy" of Gowers.

Lesions of the optic chasm frequently go unrecognized according to De Schweinitz and Carpenter[41], because of failure to determine the precise character of the visual field, for which determination the most refined methods are absolutely indispensable. The most characteristic alteration of the visual field is a bitemporal hemianopsia which is pathogonomonic. Simple and post neuritic atrophy, partial atrophy, optic neuritis of all grades of severity and choked disk all occur in diseases of the chiasm.

Sympathetic disease manifesting itself solely in the retro-ocular portion of the optic nerve is the almost unique observation of Consiglio[42]. There appears to be only one other case in literature.

An observation of great interest is that by Sachsalber[43] on the total disappearance of medullated nerve fibers in the retina after inflammatory atrophy of the optic nerve from cerebral tumor.

The possible disastrous effects of iodoform on the eye is well illustrated by Mohr's[44] case of papilloretinitis (later atrophy) following the injection of a 10 per cent. iodoform emulsion in coxitis.

Injuries and Entozoa.

Radial ruptures of the iris are much less frequent than peripheral detachments from the ciliary body. Of extreme rarity is double radial rupture. Ayres[45] describes such a case following gun-shot injury to the lower lid, in which the iris was detached from both sides as well as from the ciliary border. A burn of the eye and lid by potassium permanganate crystals is reported by Powell[46] with complete recovery under the use locally of castor oil.

The successful removal of a subretinal cysticercus situated below and external to the papilla is reported by Bardelli[47], who comments on the value of Folsini's method for determining the presence of intraocular cysticercus. The method is as follows: Light is projected into the immovable eye at a distance of 50 cm. If the parasite be present the pupil is seen to be occupied by a shadow which shrinks and expands, occasioned by the movement of the cysticercus.

Sympathetic Ophthalmia.

The rare occurrence of this disease after panophthalmitis seems now to be well established. A case has been published by Ahlstrom[48] who refers to two prior cases published by Schirmer. Reference was made in this Review for 1903 to the cytotoxin theory of sympathetic ophthalmia elaborated by Pusey. A similar conception has been developed by Golovine[49] who holds that there is brought about a destruction of ciliary cells whose absorption gives rise to the formation of cytotoxins in the system. Under certain conditions these cytotoxins are conveyed to the fellow eye where they are capable of setting up isms in the blood might also contribute but their role would be a similar process in the corresponding ciliary region. Organ- a subsidiary one. In pursuance of this theory, Golovine endeavored to cause heterotoxines to be elaborated by animals of one species which should be specific for animals of another. He injected repeatedly into the peritoneal cavity of the rabbit an emulsion made from the ciliary body and iris of the dog. When the cytotoxic serum is injected into the eye the same picture is always presented: circumcorneal injection; numerous small deposits on the posterior surface of the cornea as in keratitis punctata; fibrinous exudate into the anterior chamber, and iritis. Microscopically, the anterior chamber contains a sero-fibrinous exudate with phagocytes full of pigment granules, iritis, infiltration of the pectinate ligament: fibrinous exudation into the ciliary body in which pigment bearing leukocytes are imbedded. The cells of the ciliary body are swollen, the nuclei are atrophied and often vacuolated. When the serum is injected into the general circulation there are no visible ocular changes, but microscopically there is found a fibrinous exudation under the epithelium, swelling of the epithelial cells, and vacuole formation in the nuclei. There is intense depigmentation of the pigmentary layer.

Glaucoma.

In the diagnosis of glaucoma simplex increasing importance is attached to the exact determination of the visual field by the method of Bjerrum. This is made with a black velvet screen placed at 1 to 2 meters from the patient, the test objects being minute ivory balls. In glaucoma (in distinction to optic atrophy) there exists a defect in peripheral acuteness which extends right up to the blind spot. Increased tension after contusion of the globe is ascribed by Peters[50] to a change in the consistency of the aqueous which becomes gelatinous thus mechanically obstructing the circulation in the angle of the chamber. Cloudiness of the cornea in glaucoma has generally been ascribed to edema of the stroma. Silex[51], who has made a very careful study of this condition, concludes that the cloudiness is due to a multiple reflection of light incident to the formation of doubly refracting elements by the stretching of the corneal fibers. It would appear that less and less attention is being paid to sympathectomy, but that it may occasionally be of immense service is indicated by Henderson's[52] report of excellent results from total bilateral removal in chronic congestive glaucoma and in glaucoma simplex after unsuccessful iridectomies. Paracentesis of the anterior chamber by galvanopuncture as a compromise between iridectomy which may be refused by a timid patiest and no operation at all is suggested by Haberkamp[53]. He has found that a puncture made in this manner heals very slowly so that drainage is prolonged.

Therapy.

Several reports adverse to the use of Roemer's pneumococcus-serum in serpent ulcer have been published, notably by Zur Nedden[54] and Paul[55]. Roemer[56] himself (as is generally the case with inventors) claims an almost specific action for his serum. Intra-ocular disinfection by iodoform appears to have earned for itself a permanent place among ophthalmic therapeutic methods. An opposite view is held by Krauss[57], who, from an examination of the literature and personal animal experimentation concludes that iodoform disinfection rather hinders cure and does not invariably prevent sympathetic disease. He believes that the application of general surgical principles in infected wounds of the eye would give better results. Dionin is gaining wider and wider recognition as an extremely valuable agent in a large number of external and internal diseases of the eye. In subconjunctival injection it was found by Blanco[58] to cause resorption of a severe intra-ocular hemorrhage with restoration of vision to normal. The wisdom of the routine application of an occlusive dressing in many ulcerative affections of the cornea is called in question by McGillivray[59] in a paper entitled "The importance of the corneal temperature and nictitation in corneal therapeutics." By means of the thermo-electric couple he determined that the temperature of the cornea was 18° F. below that of the body. Closure of the lids, as from photophobia, raises the temperature of the cornea to the point most favorable to micro-organic growth. At the same time the abolition of winking is disadvantageous, as normal nictitation is an efficient means of freeing the corneal surface of germs. For corneal ulcers which refuse to heal under the lotion, atropin and bandage treatment, Lawson finds that a 1 per cent. solution of quinin sulphate is remarkably efficacious.

Daxenberger[60] has used with success a 10 per cent. solution of aristol in oil of sesamum, especially in blepharitis, lime burns of the conjunctiva and cornea and in phlyctenular keratitis. A novel method of treating tobacco amplyopia is advanced by Wray[61]. On the assumption that the tobacco poison is largely eliminated by the kidneys, he orders his patient to drink copious-ly of warm water several times a day. Several cases are reported in which cure was effected in a short time, the patients continuing meanwhile the moderate use of tobacco. In view of the increasing popularity of preparations of suprarenal gland it should be noted that occasionally unlooked for the untoward results may attend their use. Thus Senn[62] used adrenalin 1-1000 in conjunction with eserin 1 per cent. in a case of chronic glaucoma. Fifteen minutes later his patient was suffering intense pain, the globe was "glassy white" and stony hard and the pupil was dilated *ad maximum.* Valude[63] has found that antipyrin is remarkably efficacious in optic atrophy consecutive to acute infectious cerebral processes. Stovain, the new anaesthetic, seems to have acquired a permanent place in ocular therapeutics, especially in subconjunctival injections. A new anesthetic—alypin—is commented upon favorably by Stephenson. Liekienik[64] reports a series of 310 cases of trachoma treated by means of a glass ball, 7-10 mm. in diameter, mounted on a long handle. The ball is dipped in an antiseptic solution, introduced under the lid and stroked back and forth. It is claimed that both granulations and pannus yield quickly.

Operations.

The ancient question as to the advisability of enucleating during panophthalmitis is discussed by Enslin and Kuwahara who had the misfortune to lose a patient from acute meningitis following removal of a chronically inflamed soft globe. During operation the sclera was buttonholed and the freshly cut tissues of the orbit were apparently infected by the intra-ocular bacteria. The weight of present day opinion seems to be against enucleation, although strong support is given the opposite view (Nettleship, Marshall). An interesting controversy as to the relative merits of sclerotomy and iridectomy was waged between Dianoux[65] and Abadie. Abadie, the champion of iridectomy, avers that sclerotomy is powerless to check the glaucomatous process and that the benefits derived endure only a few weeks. Dianoux, who has abandoned iridectomy entirely, believes that the crux of the whole matter lies in an imperfect understanding of what is meant by sclerotomy, most operations going by this name being, in Dianoux's opinion, little better than paracentesis. He operates as follows: puncture and counterpuncture are situated at the root of the iris, as indicated by the engorged vessels coming from Schlemm's canal. After rotary movements to permit the escape of aqueous, the wounds are enlarged to 3 mm. The next step consists in withdrawing the knife into the anterior chamber, the point marking out a furrow in the angle of the cornea and iris up to the wound of entrance. It is essential that the true sclera be incised. The after treatment is just as important as the operation which is merely the first step in the management of the case. Twelve hours after the operation the dressing is removed and the globe is gently massaged, thus effecting a partial reopening of the wounds and causing an escape of aqueous into the spaces under the conjunctiva. This procedure is repeated for the next 4-5 days and a collyrium of eserin, pilocarpin and cocain is used. Dianoux is convinced that if the patient gets sufficiently interested in the mechanics of his own case to carry out a prolonged after treatment with miotics faithfully, he will be permanently relieved of his trouble. An observation of Axenfeld that a certain proportion of glaucomas operated by iridectomy or sclerotomy showed a detachment of the chorioid led Heine[66] to investigate whether an artificial communication between the anterior chamber and the suprachorioidal space might not be an efficient means of lowering intra-ocular pressure. The communication was effected by pushing a stylet through a scleral puncture, penetrating the pectinate ligament and thus entering the anterior chamber. The results in twenty blind glaucomatous eyes were distinctly encouraging, all showing permanent decrease in tension. The operation is called "cyclodialysis."

The deplorable condition known as "cicatricial orbit," in which the contraction of the socket after removal of an eye reaches such a degree that the wearing of an artificial eye is impossible, has engaged the attention of a number of operators, notably Grunert, Gullstrand and Hotz[67]. Through their efforts and that of Maxwell the condition can now be attacked with every prospect of success. Two successful cases of the Maxwell operations have recently been reported by Ball[68].

Instruments and Apparatus.

A needle holder for straight and curved needles has been devised by Cole Baker. Four rods are clamped together at one end, the other ends being bevelled so as to admit of separation. Over the rods runs a tube one inch in length which can be freely moved toward either the clamped or free ends. The latter can thus be made to close over a straight or curved needle which is firmly held. In use the instrument is simply rotated by the fingers thus insuring a delicacy and accuracy greater than with needle holders of the ordinary type. Several devices for applying a stream of warm air to the eyes and adnexa have been described. Hoor's[69] apparatus consists of two small boxes fastened on a V-shaped holder. Asbestos interwoven with electric wires which can be attached to the street current furnishes the heat. Two very ingenious clamps for holding the lid in eversion and controlling hemorrhage have been devised by Ewing[70] to facilitate incision of the tarsus in his operation for entropion. The reviewer has had some experience with these clamps and finds they are simple and effective for the purposes designed.

Amblyopia and Visual Defects.

Heine[71] avers that the cause of congenital amblyopia in 90 per cent. of the cases is a round or oval absolute or relative central scotoma. The condition is either functional, in which case it is acquired in early infancy; or congenital, and then anatomical. Ophthalmoscopic changes are not missing entirely but are rare. Often the only sign will be a difference in the macular and foveal reflexes of the two eyes. Stuelp's[72] report of a case of amaurosis from *Filix mas* gains its especial interest from the fact that it is the first case in literature in which an ophthalmoscopic examination was made shortly after the onset of blindness. The pupils were dilated and fixed. The entire fundus was covered with a copious snow-white edema. The arteries were like threads with columns of blood broken into little portions; the veins were tortuous and filled with broad and dark columns of blood. One month later the disks were white, the fundus splotched with white and a triangular grey red spot occupied the fovea. A very few arteries, yellowish and cord like, could be seen here and there. Stuelp believes that the poison, conveyed by the blood stream, irritated the finer muscular tissue of the vessel walls and caused spasmodic contraction followed by paralysis of the muscular coat, vascular stasis, and deeper paralysis of the ganglion cells and prolongations.

Refraction and Optical Questions.

Permanent myopia developing as the result of traumatism is the subject of an interesting paper by Bourgeois[73]. The condition is probably not as rare as the rather scanty literature would seem to indicate. In hitherto recorded cases the myopia has been temporary. The forward propulsion of the lens becomes possible only by the stretching or tearing of the zonule of Zinn. As the lens and iris are thrown forward the aqueous is forced backwards into the posterior chamber or circumlental space, and that space remains distended by aqueous unless the fibers of the zonule recover sufficiently to draw the lens back and so relieve the pressure against the iris.

A most interesting study and one that has a distinctly practical bearing is that by Lagrange[74] on the change in the grade of astigmatism with increasing years. He has determined that the astigmatism of hypermetropes has a marked tendency to increase with age and this tendency is greater if the patient has never worn correcting lenses. The astigmatism of myopes, on the contrary has a slight tendency to diminish. The change, as indicated by retinoscopy, seems to be an increase in convexity of the horizontal meridian of the cornea. These results suggest the advisability of undercorrecting astigmatism in young persons. Modification of one meridian of the corneal curve has been observed by Deschamps[75] to follow subconjunctival injections, an effect attributal to traction on the cornea by the conjunctiva which has become adherent to the sclera. Test types consisting of alternate red and green stripes 6 mm. in diameter, running at different inclinations to conform to the different meridians of astigmatism have been devised by Polack[76]. When viewed at 5 meters the hypermetrope sees the green bars white and the red a dull red: the myope sees red as pale rose and the green as a grey: the emmetrope the green as full green and the red a bright red. The testing is carried out in the ordinary manner with the lens box.

Disturbances of Motility.

The subject of associated movements of the head and eyes in infants is described by Hamill and Posey[77] who report three cases. In all there were constant shaking movements of the head and nystagmus. The immediate etiological factor is unknown but it appears that rickets is a predisposing factor. The authors incline to the view that the seizures point to instability of the motor centers above the nuclei in the spinal cord and fourth ventricle, therefore attributing the disorder to a functional or other disturbance of the cerebral cortex. The child has acquired certain voluntary or purposive movements of the head and eyeballs but these have not as yet become thoroughly organized and fixed in the psycho-motor areas of the brain. Hence a dissolution takes place because of the inability of the strained cortical centers to stand the work to which they have been too early subjected.

Relations with Medicine.

It is well known that optic neuritis occasionally develops during the course of typhoid fever. Its occurrence in paratyphoid is reported by Flautau[78]. Tetanus following injuries to the eye is very rare. Two cases have been published—one by Ramsay[79] following a contusion wound of the outer canthus, the other by Oeller[80] following panophthalmitis. It is a curious fact and one difficult to explain that the prognosis for life in diabetic retinitis is rather better than in the similar retinitis of Bright's disease. Nettleship[81] reports a series of forty-eight cases of retinal changes in diabetes of which 60 per cent. were living two years later and only 20 per cent. died within a year. The ocular complications of cerebro-spinal meningitis are discussed by Heine[82] who recognizes three principal groups. 1st. Affections of the motor apparatus. Infrequency of winking is of diagnostic value as an early sign. Sixth nerve paralysis is frequent. All the extrinsic muscles are at times involved. 2d. Retinal hemorrhages, slight optic neuritis. Basilar meningitis is responsible for sudden blindness without ophthalmoscopic change. 3d. Metastatic uveitis, pyemic panophthalmitis the pus containing Weichselbaum's diplococcus. The occurrence of panophthalmitis does not appear to make the prognosis any more grave.

Teilleis[83] has published a new ocular sign in exophthalmic goitre, namely, abnormal brownish pigmentation of the eyelids.

Eye and Sinuses.

The role played in diseases of the eye by the accessory sinuses of the nose is yearly gaining wider and wider recognition. Posey[84] in a short but highly instructive paper refers to some ophthalmologic phases of diseases of the accessory sinuses. He notes slight optic neuritis in ethmoid, sphenoid and antral disease. Other ocular symptoms are edema of the lid, paresis of the extra-ocular muscles, pseudo-migraine ophthalmique, etc. Uveitis and vitreous opacities are ascribed by Fish[85] and Patterson[86] to accessory sinus disease. The pain in such cases is referred to the eye. Fish's six cases of uveitis were cured by probing and syringing diseased frontal sinuses.

Miscellaneous.

The actual conditions under which enginemen have to work was investigated by N. M. Black, who, armed with a camera, traveled several thousand miles in an engine cab. He secured very valuable data tending to show that various external conditions may alter the appearance of signals or obscure them altogether. Black believes that it is often impossible for the engineer to discern the precise character of a signal and is surprised that accidents are not more frequent than they are.

New Publications.

The following is by no means exhaustive but is believed to include most of the new books of importance. "Die Wirkungen von Arznei-Mitteln und Giften auf das Auge," by Lewin and Guillery. "Encyclopedie francaise d'ophtalmologie"—Tome quatrieme—by Lagrange and Valude. "Syphilis of the Eye," by Terrien. "Ophthalmic Operations," by Czermak. "The Muscular Tissue of the Human Iris; its Structure and Development," by Forsmark. "Errors of Refraction," by Charles Blair. "The Conjunctiva in Health and Disease," by N. B. Harman. "Atlas and Epitome of Operative Ophthalmology," by Haab and De Schweinitz. "Investigations on the Pigmentation of the Retina," by Hirsch. "The Ophthalmic Year Book for 1905," by Jackson and De Schweinitz. "Ocular Affections Connected with the Female Genital Organs," by Berger and Loewy. "Local Anaesthesia in Ophthalmology," by Prof. Best. "The Artificial Eye," by Robert Coulomb. "The Pathology of the Eye," by J. Herbert Parsons."

The deaths of the year include Johann Hjort, Parinaud and Frank Buller.

SOME CELLULAR CHANGES IN THE PRIMARY OPTIC VESICLES OF NECTURUS.

By Clarence Loeb, A. M., M. D.,

ST. LOUIS.

(From the Anatomical Laboratory, St. Louis University.)

(With One Plate.)

A superficial study of the optic vesicles as they develop in Necturus showed certain interesting features, which have not been heretofore described. On account of the large size of its cellular elements, the cytological changes in this animal admit of a more exact interpretation than is afforded by other vertebrates.

The formation of the neural plate in Necturus is initiated by certain changes in the ectodermal cells, which elongate from the low cuboidal of the superficial ectoderm to the long columnar type, as shown in Fig. 1, *e. c.* and *n. c.* The same changes are shown under higher magnification in Figs. 7 and 8, Fig. 7 representing a cell near the center of the neural plate, and Fig. 8 an ectodermal cell beyond the margin of the neural plate.

The cells of which Fig. 7 is a type are divisible into two parts, a proximal and a distal. The former is full of yolk granules and usually contains the nucleus. This nucleus varies in shape from round to long oval, its long diameter being from two to three times the short. Sometimes it is irregular in shape, in which case it is usually found near the center of the neural plate. When the nucleus lies in the distal part of the cell, it is frequently observed undergoing mitosis.

The distal part of the cell may contain a few yolk granules, which are usually small and of indistinct contour, as shown in Fig. 7. This portion does not stain readily, shows a distinct membrane, and is free from yolk granules. Such polarity is most marked in the cells (Fig. 1, *n.c.*) near the center of the neural plate. From here outwards, towards either side of the neural plate, the nuclei are rounder, the cells shorter, and the granules encroach more and more on the clear portion of the cell.

As soon as the neural plate is well defined (Fig. 2, *n.p.*), the outlines of the individual cells become less distinct, though

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each presents the same general characteristics observed in the preceding stage, as representd in Fig. 7. The neural plate is now composed of two or three layers of columnar cells. The neural cells forming the upper layer show the portion spoken of above as free from yolk granules. They are so arranged that a clear band stretches from one margin of the plate to the other. The ectoderm of the remainder of the embryo becomes two-layered as it approaches the neural plate, and ends abruptly at the margins of the latter, which already shows an incipient infolding (Fig. 2, *n.p.*). The further development of the neural plate is characterized by an increase in the nuumber of cells composing it, and by an approximation of its margins, which grow together to form a tube, as shown in Figs. 3, 4 and 5.

By the time the anterior part of the neural canal is formed and the *Anlagen* of the optic vesicles appear, the neural tube has the general shape of a spherical triangle, the two basal angles being formed by the *Anlagen* of the optic vesicles (Fig. 3, *o.v.*). The plane of the section represented is through a part where the canal has not quite closed. The wall is composed of many layers of cells, and varies in thickness in different localities. It is, in general, thinner in the region of the future optic vesicles. The cells forming the lining layer abut upon the lumen in an irregular line, as represented in Fig. 3.

The nuclei (*n.n.*) in the wall of the neural canal vary greatly in outline. Some are round, some oblong, while a large number are irregular, showing a prolongation in the direction of the lumen. Some of the latter are shown under higher magnification, in Figs. 9, 10, 11. These represent three cells from the same field, and illustrate different stages of the same phenomenon. The body of each nucleus shows a number of scattered karyosomes, while the prolongation is more or less striated, the striae running parallel to its long axis. The appearance of the cytoplasm and the nuclei indicates that the cells are migratory.

Some of the nuclei are undergoing karyokinesis and these, as well as the ameboid forms of nuclei, are more numerous where the walls are thinnest, being especially so in the region of the optic vesicles. In places the cells are seen dividing, where one-half is being thrust out into the lumen.

The lumen of the canal contains a mass which can be resolved into three constituents; (1) and most numerous, are round structures slightly larger than the neighboring nuclei, which are massed together and more or less completely fill the lumen. These will be shown to be cells in various stages of degeneration; (2) nuclei and larger remnants of the same; (3) detritus.

The first of the contents of the lumen consists of well defined cell outlines. They are round, of nearly constant size, having an average diameter of 40 micra, and are usually clear and devoid of yolk granules, as depicted in Fig. 3, *l.c.* They are more numerous near the head end of the embryo, especially in the region of the future optic vesicles.

The nuclei lying in the lumen are, in a varying degree, smaller and less deeply stained than those in the wall of the tube. They may be round or may assume ameboid forms (Figs. 12, 13, 14). Some are pear shaped (Figs. 13, 14), with the larger mass extending into the lumen. Many appear (Fig. 13) as if the chromatin is passing out of the basal portion of the cell and becoming rounded up in the distal portion.

The round forms of the nuclei either show a cell membrane around them, or where this is not distinct, there are yolk granules present, indicating the position of the cell. A few nuclei lie in the lumen independent of any connections with a cell, but form their small size, faint staining capacity, and general indistinctness, we may conclude that they are degenerating.

The third constituent of the contents of the lumen is a debris composed of fragments of yolk granules, disintegrating nuclei, and remains of cell membranes.

In the next stage (Fig. 4) the development of the embryo has advanced so far that the optic vesicles (*o.v.*) are distinct evaginations of the neural canal. The figure shows a section through the neural canal and the centers of the optic vesicles. The nuclei of the neural cells lying next to the lumen show a tendency to assume ameboid forms which however, are not as pronounced as in the preceding stage. They are most numerous in the dorsal wall of the canal, and in the superior wall of the optic vesicles. Along the margin, nuclei undergoing degeneration are occasionally seen.

The center of the lumen is entirely free from cellular elements or their remnants. The remainder of the neural canal shows the cell outlines described above, some nuclei and a few yolk granules. The cells of the optic vesicles are more compact, larger and more irregular than those lying towards the center of the canal. Where the section does not pass exactly through the center of the optic vesicles, but on either side, the central space is larger, and the mass of cell outlines lies in or near the optic vesicles. The nuclei lying in the lumen are round and no longer show ameboid forms. In Fig. 4, there are shown nuclei (*l.n.*) with well defined chromatin threads, while in other nuclei these threads have fused into a dense mass.

Fig. 5 represents a section through the neural canal and optic vesicles (*o.v.*) of the next stage. The cells in the wall are arranged in two or three layers. The dorsal wall of the canal is still from three to six layers of cells in thickness, but most of the nuclei are ameboid in shape or undergoing mitosis. In the lumen the conditions described above are accentuated. The clear central space is very large and extends nearly from the dorsal to the ventral wall of the canal. The remainder of the lumen, especially the optic vesicles, is filled with cells and nuclei in various stages of degeneration.

In the next stage (Fig. 6, *o.v.*), the optic vesicles are joined to the neural canal by a short hollow stalk. The nuclei lying in the wall of both the neural tube and the optic vesicles (*n.n.*) are oval or round, there being no ameboid forms present. By this time, the cellular elements have disappeared from the cavities of both the neural canal and the optic vesicles. A minimal amount of detritus can be detected, but this is probably of accidental origin; at any rate it bears no resemblance to what has been described and depicted in the earlier stages. During the later development of the embryo, the lumen remains clear until it is obliterated by the approximation of the outer and inner layers of the optic cup.

Of special interest are; (a) the nature, (b) the origin, and (c) the fate of the structures found in the neural canal and optic vesicles. While these questions cannot be answered to complete satisfaction, enough is known to show that they are probably of great significance.

In regard to their nature, there is hardly any doubt that they are cells. They have the form and physical properties of cells, some possess a nucleus, and many contain yolk granules. They are too numerous to be accidental, and too regular and characteristic to be the product of coagulated albumin. Their number, regularity, and position, coupled with the general appearance of the sections, speak against the assumption that they are portions of long columnar cells cut obliquely. Taking all these facts into consideration, it is probably correct to regard them as cells which in some way have passed into the lumen of the canal.

As to the origin of the cells, it would seem that they are derived from the cells in the wall of the neural canal, including the optic vesicles, in one of two ways; (a) by a migration of a part or all of the cell into the lumen of the canal, and (b) by a mitosis of the cells lining the canal, with extrusion into it of one of the daughter cells. Numerous examples of the former process are found, to a few of which reference has been made (Figs. 9, 10, 11, 12, 13, 14). Examples of (b) are more rarely found, but are undoubtedly present.

As to the fate of the cells, it may be said that as soon as the cell enters the canal, it becomes rounded and the nucleus undergoes chromatolysis and disintegrates, followed by the remainder of the cell, the cell membrane being the last structure to vanish. The cells most distant from the neural wall are the first to disintegrate and are in some way absorbed, leaving a clear central space. This process continues until all the cells have disappeared and the clear space is identical with the central cavity of the neural canal and the optic vesicles.

A word might be added in regard to the development of the optic vesicles in the Dipnoans (3, p. 439), the Ganoids (1. p. 365) and the Teleosts (2 p. 185; 5, p. 243). In these, the eye develops as a solid outgrowth from a solid neural tube, and a cavity subsequently arises either by a splitting apart of the cells, or by an actual absorption of those lying most centrally.

In the Amniota, (4), on the other hand, e. g. birds and mammals, the optic vesicles develop as hollow projections of the wall of the neural tube, whose cavities subsequently become obliterated by the approximation of their walls.

The process observed in Necturus conforms to neither type. As shown above, the walls of the optic vesicle increase rapidly in thickness until a certain maximal stage is reached, after which they undergo a thinning until practically only a single layer remains. During this period, the peculiar cells described above appear in the lumen and undergo disintegration. The wall of the optic vesicle at the time it begins to bud off from the main neural tube encloses a cavity which is filled with cast off cells from its own wall, on the way to disintegration. Once free from its contents, the vesicle proceeds to develop without again showing these structures.

It is thus seen that in its development, the eye passes through a stage that certainly recalls the condition found in so many of the Anamnia. Whether or not this is to be considered of phylogenetic significance must remain an open question for the present.

The specimens on which the preceding observations were made are a part of the private collection of Professor A. C. Eycleshymer, to whom I am indebted for their use, and for valuable assistance.

BIBLIOGRAPHY.

1. **Balfour, F. M., and Parker, W. N.**
   On the Structure and Development of Lepidosteus. Phil. Tr. London, Vol. XLVI (1882), pp. 359-442.
2. **Eigenmann, Carl H.**
   The Eyes of the Blind Vertebrates of North America. V. The History of the Eye of the Blind Fish Amblyopsis from its Appearance to its Disintegration in Old Age. Mark Anniversary Volume (New York. Henry Holt) 1903, pp. 167-204.
3. **Kerr, J. Graham.**
   The Development of Lepidosiren paradoxa. Part III. Development of the Skin and its Derivations. Quart. Jour. Micr. Sc., London. Vol. XLVI (1902), pp. 417-454.
4. **Marshall, A. M.**
   Vertebrate Embryology. (London: Smith, Eldred & Co.) 1893, pp. 1-621.
5. **Wilson, H. V.**
   The Embryology of the Sea Bass (Serranus atrarius). Bull. U. S. Fish Com. Vol. IX (1899), pp. 209-277.

EXPLANATION OF FIGURES.

List of Abbreviations.

e. c.—ectodermal cells.
l. c.—cells in lumen of neural canal.
l. n.—nuclei in lumen of neural canal.
n.—nuclei.
n. c.—cell in wall of neral plate or tube.
n. n.—nuclei in wall of neural tube.
n. p.—neural plate.
o. v.—optic vesicles.
p.—projection of nucleus.
y. c.—yolk cells.
y. g.—yolk granules.

PLATE V.

Fig. 1, represents a transverse section of a 12-day embryo of Necturus through the anterior portion of the cephalic neural plate.

Fig 2, represents a transverse section of a 14-day embryo of Necturus through the region of the Anlagen of the primary optic vesicles.

Fig 3, represents a transverse section of a 16-day embryo of Necturus through the primary optic vesicle. In this stage the neural folds have approximated, but are as yet not closed. The optic vesicles and the neural groove are filled with cellular structures.

Fig 4, represents a transverse section of an 18-day embryo of Necturus through the primary optic vesicles, which are now well defined. The neural folds have closed, and the superficial epiblast has separated from the neural epiblast. The cellular contents of the neural canal are less compact, indicating the beginning of cell disintegration in the median portion.

Fig 5, presents a transverse section of an 18 1-2-day embryo of Necturus passing through the primary optic vesicles, whose walls are now thinned to a single layer of cells, as shown in the optic vesicle on the right. Cellular disintegration has taken place at the center of the neural canal, leaving a well defined clear space. This condition represents an advance beyond that shown in Fig. 4.

Fig. 6, represents a section, intermediate between horizontal and transverse, of a 20-day embryo of Necturus. The optic vesicles are well advanced, showing a distinct evagination and backward growth. At this time the lumen is entirely free from cells or their remains.

Figs. 7-15, illustrate the cytologic changes in the cytoplasm and nuclei of the cells which take part in the formation of the walls and cavities of the primary optic vesicles.

2. Lancet, July 16, 1894.

THE CRYSTALLINE LENS IN HEALTH AND IN CATARACT.*

By Sir William Job Collins, M. S., M. D., B. Sc. Lond., F. R. C. S. Eng.,

Fellow and Senator of the University of London; Chairman of L. C. C. Education Committee; Surgeon, Royal Eye Hospital, Southwark.

Gentlemen.—If and when the complete history of ophthalmology is well and truly writ, I trust that one mention will be made of, and due credit will be ascribed to, the life and labors of Alhazen, the Saracen. He flourished in the eleventh century of our era, and died at Cairo in 1038. He was, alike in theory and practice, a man in advance of his time, and perhaps was more successful with his theories than with his practice. It is true he failed in his undertaking to dam the Nile, a work the completion of which it has been reserved for this generation to witness. He, however, seems to have been the first to explain that vision was due, not to some emissive property or tentacular agency on the part of the eyes, but to the refractive influence of their translucent media and to sensory impressions made upon the retinae. He also demonstrated atmospheric reflection and refraction, thus accounting for the phenomena of twilight and of the apparent reduction of size of heavenly bodies as they pass from the horizon towards the zenith. Before Alhazen's time the role of the crystalline lens was incomprehensible and mysterious. It had been sanctified by the ancients as the seat, or one of the seats, of the soul, while other old authorities had deemed it to be the organ of vision; just as the vulgar to-day will sometimes bring the extruded lens from a case of perforative ulceration of the cornea and tell you the child's "sight" has come out.

It is not surprising that a structure so beautiful and so unique in the animal economy as the lens should, even in these prosaic times, excite our thoughtful scrutiny, and we do but find our interest stimulated and fascinated as we proceed to investigate the development, the structure, the function, and even the defects and diseases of this dioptric jewel of the globe.

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*British Medical Journal, December 2, 1905. Delivered before the Post-Graduate Class of Ophthalmology in the University of Oxford, July 10, 1905.

I need not tell you that no amount of condensation will enable me to crowd into the limits of a single lecture even a resume of the work that has been accomplished in this department of ophthalmology; the lecturer and the subject of the lecture being alike the selection of your excellent Reader, Mr. Doyne, I am absolved of responsibility, while the amplitude of the title will enable me to dwell on such topics as I have paid special attention to while passing lightly over such matters as you will find adequately dealt with in the ordinary textbooks.

The crystalline lens, in almost every aspect in which we approach it as an object of study, presents features which, if not unique, are almost without parallel in other structures of the body. Take, for example, its persistent growth from infancy to age; its complete isolation from blood supply, coupled with its most perfect nutrition by endosmotic and exosmotic currents; its elasticity so perfectly controlled by muscular action as to subserve faithfully the purposes of the most delicate of our senses; while its pellucidity, which is shared by the other dioptric media, is, in its case, accompanied and sustained by a construction so complex, and a mode of growth so involved, that there are some points in relation to both which have not yet been thoroughly elucidated.

The role of the lens in disease has afforded no less occasion for wonder, mystery and disputation. By a curious inversion of order, successful treatment of cataract appears to have preceded any accurate knowledge of its cause. It would almost seem either that a traditional treatment had survived the knowledge on which it was originally based, or that a preestablished harmony had guided the hand of the empiric.

Thus, Albucasis the Moor, a skilful surgeon of Cordova in the eleventh and twelfth centuries, has a chapter on the cure of cataract by depression, and, in a fine reproduction of his works in Arabic and Latin, edited by Channing at Oxford in 1778, you will find a neat representation of the instrument he employed. Yet he speaks *"de cura aquae quae descendit in oculo vel cataracta."* Pliny and Galen seem to have been acquainted with "couching." The term cataract appears to have been employed by the School of Salerno, but whether used metaphorically, as in the quotation I gave from Albucasis, or in the sense of "breaking down" or "confusing" is not clear. The Latin "suffusio," and the Arabo-barbarian "gutta in oculo," are terms borrowed from humoral pathology. How, indeed, was any rational pathology then possible?

However, since Helmholtz presented us with the ophthalmoscope, about the middle of last century, much mystery has been cleared away. Amaurosis, that invention of the schoolmen which connoted a condition of the eye in which neither the patient nor the oculist could see anything, has been resolved, and the parts played by the lenticular and the deeper structures of the globe respectively in its production have been correctly apportioned, while the old confusion between glaucoma and cataract has been for ever set at rest.

M. Brisseau, of Tournai, appears to have been the first to explain correctly the true nature of cataract. A soldier with cataract having died in the Tournai Hospital in 1705, he examined the eyes post mortem; he thereupon made the startling discovery that a cataract was nothing but an opaque lens, and not a membrane engendered in the aqueous. Much elated, he reported his secret to Duverney, who would not hear of it, and advised Brisseau not to endanger his reputation by publishing so ridiculous a proposition; moreover, the iconoclastic Brisseau was given to understand that his discovery might occasion offence to some members of the Academy who had written on optics.

Such are the perils that await the reformer, even in matters of science, when authority is at variance with the facts. The sequel is not uninstructive; poor Brisseau published his thesis, and he was thereupon informed, not that he was wrong, but that it was no discovery after all, in fact, that he had been anticipated by other observers some forty years previously. How true is the observation that a test of truth is its capacity for re-discovery.

Even nowadays the term "cataract," which may be used as synonymous with any departure from pellucidity of the lens or its capsule, is still received by the laity with scarcely less awe and foreboding than are those other terms of terror commencing with the same initial, "consumption," and "cancer." Happily, with our modern methods of ophthalmic surgery we are able authoritatively to assuage such terror as often groundless. The lens, even in its opacity, is again unique in this fact, that, having ceased to be useful, it can very well be done without, and that, after its successful extraction, almost perfect sight may be restored, and that, too, without the long period of waiting in twilight which was once the pitiable lot of the cataractous.

Just as von Baer has taught us that the embryological history of the higher organisms repeats, as in epitome, the evolutionary history of the race, so in the case of an individual and highly differentiated organ like the human eye, as we trace its building up in the embryo, we pass—though it may be rapidly—in review some of the stages which are recognized as final in the lower animals; and the story is again true as we study in detail the embryological history and comparative anatomy of its component parts.

Whether we turn our attention to the rudimentary eyes of the leech, or the starfish, or to the multitude of eye dots which are scattered over the surface of some of the marine slugs such as *Onchidium*, or, on the other hand, investigate the compound eyes of insects and crustaceans, or the refractive eyes of cephalopods and vertebrates, we find three elements, all owning an epiblastic origin, early co-operating in promoting some influence or impression by the outside world upon the nervous system of the individual. These three elements are—(1) nerve fibre; (2) pigment cells; (3) a crystalline medium.

How the collocation of these three elements, perhaps at first fortuitous, then subserving some humble function (possibly nutritive in its nature), later on evolve, by gradual steps, into an elaborate optical camera for conveying visual impressions is a problem upon which we may speculate at pleasure. We know that animal pigment, like chlorophyll in plants, not improbably plays an important part in facilitating absorption of chemical energy from the sun. Any collection or concentration of light by a crystalline structure overlying such pigment would of course facilitate this "heliophagic" (sun-eating) process; while the stimulation of a subjacent nerve by the solar energy, and the withdrawal of such stimulus by the intervention of opaque bodies would awaken a sense of externality, excite muscular action, and lead to locomotion. It has been found that Medusæ will collect around a ray of sunlight in a darkened jar, not, presumably, because they see it, but because they eat it and gain energy from it. It is possible, then, that association of nerve, pigment, and refracting cell, all modified ectoderm, may have evolved through a heliophagic stage, and thence onward into an agency for the appreciation of light from darkness, thus giving a sense of environment more delicate than the tactile, and finally, by progressive differentiation and integration, the most delicate of the organs of special sense may have been progressively built up.

It is, however, in contemplating the progressive development of organs of such complexity and adaptation as the human eye that the insufficiency of natural selection as explanatory of the whole process is most apparent. The action and reaction of structure and function is so intimate, a slight morphological change affording some distinct dynamic advantage, or per contra some habitual physiological action effecting some desirable modification of structure, that we may find it hard to decide, which takes the initiative and which is the resultant. Indeed, whether any highly evolved organ or organism be but the heir of all the ages and survivor of the fittest as the result of mere natural selection, or, on the other hand, expresses the formulation of some increasing purpose, must be decided in accord with our particular metaphysical conceptions, but of the reality of the evolutionary process, alike in organ and in organism, there seems no room for doubt.

DEVELOPMENT.

While dealing with these general considerations it is interesting to reflect that the lens, as its alternative name reminds us, betrays an affinity with the bodies classed as crystals. Its formation and upbuilding, with geometric precision, around tri-radial or multi-radial polar axes is reminiscent of the deposition of a crystal from solution, and although it is true the analogy must not be pressed too far, it is interesting and instructive to recall this striking link in the chemicobiological chain.

In following out the life history of the lens it is well ever to bear in mind its derivation from the ectoderm, and to remember that it continues to own allegiance to cuticular tendencies even when it has entered upon an independent career in a new situation. It is also necessary to bear in mind that at an early period of fetal life this lens vesicle or follicle, when no longer pedunculated to the ectoderm, gets surrounded with a vascular envelope of mesoblastic derivation. This vascular invagination takes place through a cleft in the secondary optic cup at its lower and inner portion, and default in later closure of this cleft we know as coloboma of the iris or of the chorioid, or of both. On the other hand, the plication of this vascular sheath gives rise to the pecten of birds and the falciform fold in the eyes of fishes.

A yet more proximate influence upon the early nutrition and development of the lens is effected by a most interesting and usually evanescent structure, also of mesoblastic origin, namely, the capsulo-pupillary membrane. In 1887, in the *Moorfields Hospital Reports,* I published a case, with a picture, of the persistence of a portion of this membrane, and in the following year, in anorher paper on the capsulo-pupillary membrane, I showed how the failure to clear away some or other of the parts of this fetal scaffolding may give rise to certain vestigial anomalies and defects, and certain nòn-pathological cataracts (as I have called them), the occurrence of which needs to be borne in mind in diagnosing the nature and causation of some of the anomalies encountered in or around the lens.

It is important to remember that the iris is a relatively late outgrowth from the chorioid, and that in early fetal life the vascular envelope of the lens plays a very important part not only in nourishing the crystalline, but also in upbuilding the structures surrounding it.

Posteriorly this sheath extends into and indents the optic nerve, whose central artery is continued into it and through it to the posterior pole of the lens. Equatorially the lens capsule (if not itself derived from this sheath) is reefed into place by cordage connecting it with the ciliary processes, while anteriorily this sheath occupies the place which is destined to become the aqueous chamber.

As the iris develops and advances centripetally it comes into contact with this capsulo-pupillary sheath. Anastomosis appears to take place between their vessels along a circle which is later known as the corona iridis about a quarter or one-fifth of the distance from the sphincteric to the ciliary margin in the adult, but which was at the fetal period in question the edge of the advancing iris. At the seventh month of intrauterine life all trace of this capsulo-pupillary sheath should in the normal process fade away, while the iris continues to concentrate yet nearer to the axis of the eye.

As I showed in my paper of 1888, it is easy to see how, by the failure in one or other of these successive steps, by which the final condition which we recognize as normal is arrived at, different vestigial anomalies may result. Proceeding from behind forwards we may have:

1. Persistent hyaloid artery or patent canal of Stilling.
2. Some opacities occasionally seen in the hyaloid fossa, due to retention or failure to clarify, of some portion of the posterior part of the capsulo-pupillary tunic.
3. Some instances of circumscribed opaque plaques on the anterior surface of the lens, either with or without connecting threads with the iris; also some cases of capsular cataract and of otherwise inexplicable anterior polar cataract.
4. Many varieties, which I figured, of persistent pupillary membrane.

CHEMICO-PHYSICAL PROPERTIES OF THE LENS.

Chemically the lens is a bag of watery albumin, consisting of globulin, some alkali-albumin, and serum-albumin, and possibly some other albuminoid bodies. Its globulin appears to differ from other globulins, and to resemble vitellin in not being precipitated from dilute brine by saturation. There are also traces of salts and of cholesterin and lecithin in the normal lens. In a paper read before the British Medical Association at Leeds in 1889 I set out the results of some analyses I had made of the healthy and the cataractous human lens. I found that the clear lens contained about 70 per cent. of water (69 to 73) and 30 per cent. of solids, and of these solids 2 per cent. remained as ash after incineration. I discovered that the percentage of water in healthy lenses was much the same in a child of 10, in an adult, and in a person over 60 years of age. These results differ somewhat from those of other observers. True, the number of fresh, clear human lenses at any time available for such analysis is not large, but I may mention that they were all removed from recently-excised eyes, not from *post-mortem* cases, mostly from cases of injury or of growth not affecting the lens, and were generally on the water-bath in my laboratory within an hour of removal from the living body.*

Physically the crystalline is in man a biconvex lens, with an anterior curvature of 10 mm. radius and a posterior of 6 mm. during repose. Its specific gravity is about 1130 compared to water 1000, and as the ratio of water to solids remains constant in the clear lens throughout life, so does the specific gravity. The bearing of these facts on the alleged increase of density with age usually vouchsafed as the cause of presbyopia I shall discuss later on. The mean refractive index of the lens has been variously given as from 1.38 to 1.45, and some observers have found a slightly greater refractive index in the nuclear than in the cortical layers. It has also the property of double refraction.

The lens substance is, during life, almost perfectly diaphanous, but owing to its sectorial construction the image formed

Age.	Weight in Grams.	Water.	Solids.	Water per Cent.
10	163	113	50	69
27	188	136	52	72
40	217	157	60	72
64	247	176	71	71

In cataracts:
Water 62 per cent.
Solids 38 per cent.

---

*Water and solids in lens (W. J. C.):

by it is not absolutely stigmatic. That form of astigmatism known as irregular, which gives the "stellate" appearance to the stars, is attributable to the arrangement of the lens fibres. Some spherical aberration is also attributable to the crystalline regarded as a lens, and some entoptic phenomena are referable to the curious disposition of its fibres betwixt tri-radial axes; this dispositon may even be seen objectively in some clear lenses under certain modes of illumination, and in disease it is often disclosed very conspicuously.

The lens is truly described as very elastic in the sense of readily tending to resume its original form and volume after the withdrawal of any force that has modified its form or volume. I should not be disposed to allow that the same elasticity is true of its capsule, though this is alleged by most authors. From a study of it in dissection and in operations in health and in disease, I should be more disposed to say with Bowman, it is "a hard and dense structure, and determines the exact outline of the lens." On laceration it gapes and sometimes curls in a fashion suggesting that it is held taut by the reefing-lines that bind it to the ciliary processes. The capsule is composed of albuminoid substance, and not of elastic tissue, and betrays no trace of cellular structure.

Histologically the crystalline presents the most perfect exhibition of continuity alike in time and space betwixt cells and fibres. Thus the flattened epithelial cells beneath the anterior capsule, the lineal descendants of the cells which form the anterior walls of the primitive lens follicle, are seen towards the equator (where growth of the lens by superposition is most marked,) to elongate with exquisite gradation into nucleated fibres. These attenuated fibres may be shown to be $^1/_{5000}$ in. broad, and hexagonal on section, while in some fishes their edges are markedly dentated.

THE LIFE-HISTORY OF THE LENS.

I now proceed to what I conceive to be the most interesting and the most important considerations, both physiologically and pathologically, in the life-history of the crystalline lens.

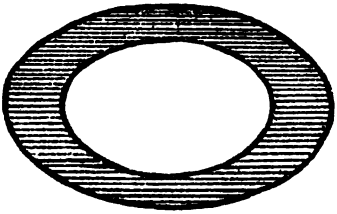
From what we have already said as to its origin from isolated epiblast, its growth by equatorial accretion of cell-born fibres, with its oldest elements enwrapped in the deeper nuclear layers, we should, *a priori,* expect the lens to grow continuously from infancy to age. Its epiblastic homologues—for example, epidermis and hair and nails—while in some respects similarly regenerated, are liable to accidents of surface, such as attrition and adventitious destruction, from which the lens, securely encapsuled yet nurtured by circumambient fluid, is practically immune. Alone of all the tissues of the body it seems to live an enchanted existence endowed with endless growth. It is in this very peculiarity there lie hid the sources of disease and default.

From my own observations and those of others I find that the human lens at birth, which approximates to the spherical form of the crystalline in fish, weighs about 120 mg., at 10 years of age about 160 mg., at 25 about 190 mg., at 45 about 220 mg., at 65 about 250 mg., and at 80 about 260 mg.

Becker found the volume of the lens at 20 to be 155 c. mm., at 50, 195 c. mm.; and at 60, 217 c. mm. Priestley Smith, from a large number of examinations of lenses taken from the body after death, found the volume of the lens increased with great regularity from 163 c. mm. in the third decade to 225 c. mm. in the seventh decade.

The antero-posterior diameter of the lens at birth is 4 mm., it is 5 mm. at 20, and 6 mm. at 60. The tranverse diameter, on the other hand, is about 5 mm. at birth, 8 mm. at 20, 9 mm. at 50, and 10 mm. in advanced life.

Remember that the specific gravity remains nearly constant throughout life, and therefore increase of weight means increase of bulk, and this increase of bulk is largely due to equatorial expansion converting a spheroidal lens at birth into an ellipsoid in the adult by progressively filling up the intracapsular circumlental space. I have endeavored in the accompanying diagram to indicate roughly the change in form which accompanies the growth of the lens. The shaded portion represents post-natal addition.



ROUGH DIAGRAM TO ILLUSTRATE GROWTH OF LENS FROM INFANCY TO AGE.

The prevalent teaching, then, that the healthy lens becomes more solid as age advances, if this be held to mean that the older lens contains more solids in proportion and less water than the young, or that the lens becomes denser in the sense that its specific gravity is increased, is a doctrine not founded on fact, and must be discarded as fallacious; and, in so far as such explanation is vouchsafed as accounting for the progressive loss of accommodation which accompanies advancing years, culminating in presbyopia, such pathology must be accordingly discounted.

The progressive increase in bulk of the lens from infancy to age needs to be enforced, and must be correlated with the progressive loss of accommodation which proceeds *pari passu*, and for which, in my opinion, it accounts.*

Becker, whose work on the crystalline is monumental, considered that the growth of the lens was arrested with the growth of the individual, at about 25. Bader, who recorded the fact that the lens at 70 is nearly as heavy again as a lens of 20, attributed this to an assumed increase of density. Norris, in 1889, though referring to Priestley Smith's and my researches, yet states that after adult life the lens grows but slowly.

Donders taught that there was an increase of solidity in the lens with age, and thus explained presbyopia and hypermetropia acquisita. *Quain's Anatomy* in 1904, alleges an increase of specific gravity in age. Lawson speaks of a loss of fluid in advancing years. Schwalbe, in Landolt and Wecker's *Traite Complet,* presuming on some unsatisfactory analyses of Deutschmann, alleges a cornification of, and loss of water by, the lens with advancing years. But, as I pointed out in a lecture on the Pathology of Cataract[1] at St. Bartholomew's Hospital in 1896, "the fictitious sclerosis of the lens fibres, which has been alleged, in so far as that term suggests dehydration, is in no sense corollary to its derivation from cuticular epiblast or its homologous relationship with the epidermis. Because the latter exposed to air and pressure tends to cornification and dehydration from its surface, that, I submit, is no reason why the lens, excluded from air—nay, bathed with fluid—should make this fallacious analogy complete. The growth and nutrition of the lens are without parallel in any other tissue of the body."

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*This correlation between increasing bulk of lens and loss of accommodation power was exhibited in the form of a diagram based upon the following figures:

Age.	Weight of Lens in Milligrams.	Amount of Accommodation in Dioptrics.
10	160	14.0
25	190	8.5
45	220	4.0
65	250	0.5
80	260	0.0

PRESBYOPIA.

Neither is the other explanation generally called in to explain the progressive loss of accommodation any more equal to the task—I mean the alleged enfeeblement of the ciliary muscle. This muscle, though unstriated yet voluntary, is scarcely likely to be so different from all other voluntary muscles that it should become the victim of a progressive palsy at the very time when the other muscles are increasing in power and development. Moreover, microscopic examination of ciliary muscles at different ages lends no support to this view.

Accepting the statement that the ciliary muscle in contracting constricts the zonule, and thereby acts as a *laxator capsulae lentis* the extent to which the elastic lens will change its form so as to increase the curvature and refractive power (chiefly of its anterior surface) must be materially affected by its increased bulk and equatorial growth as age advances. The elasticity of the capsule is not great and is certainly not unlimited; even after removal of a lens the remaining capsule is tightly stretched by the cordage of the zonule.

As the lens grows into its capsule equatorially, every year witnesses some encroachment upon the intracapsular circumlental space, and as this potential cavity becomes occupied by the augmented lens in a passive state of refraction less space and opportunity are afforded for that occasional active expansion which effects accommodation. This, I submit, affords an explanation of that remarkable correlation which I have pointed out between the progressive growth of the lens through life, and the progressive loss of accommodative power from youth to age.

I have thus been led by my investigations to propound an entirely new theory of the causation of presbyopia, which I venture to leave to your critical consideration.

Moreover, the gradual repletion of the circumlental space by the equatorial extension of the lens in later life occasions a predisposition to blockade of the filtration angle of the anterior chamber, and thus facilitates the precipitation of an attack of glaucoma. Such a sequence of events is rather more likely to come about in eyes in which the perilental space is small to start with, as is said to be the case in hypermetropia.

SENILE CATARACT.

The prevalent but erroneous teaching of the cornification and solidification of the crystalline lens as a natural senile change is responsible for the equally prevalent doctrine that the changes in the lens which we speak of as senile cataract are, in fact, merely exaggerated and intensified or accelerated senile changes. My investigations lead me to believe they are nothing of the kind, and, indeed, in some respects, the changes exhibited in cataractous lenses are the reverse of the changes which age alone brings. Thus cataractous lenses, unlike old lenses, are usually less in bulk and lighter in weight than clear lenses of corresponding ages are. In my experience it is rare to find a cataract weighing as much as 200 mg., a weight which is usually surpassed by the healthy lens at 40 years of age. If cataract were but premature senility of the lens we should expect to find cataracts weighing heavier, not lighter, than healthy lenses—114 to 136 mg. is the range of weight of a series of cataracts which I have weighed from persons of 46 to 87 years of age.

Again, I have found that while age alone gives no increase in the percentage of solids contained in the lens, in cataract the percentage of solids is increased from 30 to 38 per cent., and there is some increase in the [illegible].

BOSTON MEDICAL AUG 6 1907 LIBRARY.

Besides loss of weight and loss of water observed in cataractous lenses there are certain chemical bodies found in relative excess whose presence and amount favour the view that they have been occasioned by transformation of the albuminoid bodies contained in the normal lens, a transformation presumably due to some failure of nutrition. There is more cholesterin and lecithin, sometimes a little fat, and more salts. Dextrose has been found in some diabetic cases. Microscopically, in senile cataract we find marked fibrillation of the lens, with dissociation of the fibres; also granular or fatty degeneration and vacuolation of the fibres. Calcification, and even ossification, of the lens have been described, though the latter lacks confirmation. Fluid degeneration is sometimes encountered, and is often spoken of as Morgagnian cataract.

Traumatic cataract arising from penetrating injury is due to swelling and solution of the lens substance under the influence of the aqueous humour, a process which affords the basis of our procedure in the operative treatment of soft cataracts. The absorption and solution may be complete, or evacuation of the swollen lens debris may be necessitated through a corneal incision. In such cases, and also sometimes after extraction of senile cataracts, there may be a regeneration of cells from any epithelial residue which may be left clinging to the capsule.

Lenticular degenerative changes may appear in the cortex or in the nucleus, or in both, or in the zone between the two, or they may be dotted throughout the lens substance. Then, again, there may be opacities upon, or beneath, or in the substance of the anterior capsule. At either pole and upon the anterior capsule are the favourite seats of what I have termed non-pathological cataracts.

Reverting to the question of non-pathological cataracts, I would refer you to a paper[2] in which I drew attention to the fact that most English textbooks then accepted the usual explanation of anterior polar or capsular cataracts by way of corneal perforation and its consequences to an extent which would seem almost to exclude an embryological explanation of any opacities in that region. Those who are in the habit of minutely observing the conditions of the media of the eye in large clinics, however, cannot fail to come across, and not very infrequently, opacities in or about the crystalline which do not own a pathological origin. Native history as regards antecedent inflammation and collateral evidence arising from the normal appearance of surrounding structures compel inquiry for some embryological explanation. Here, as elsewhere, the physiological may pass almost imperceptibly into the pathological, and some default in normal embryological processes may pave the way for morbid terminations.

De Wecker, in 1886, wrote, in reference to this question:

"Evidently, then, there is still an etiological point which escapes us, and congenital forms of anterior capsular cataract should not be exclusively attributed to a prolonged contact with a perforated cornea, and still less so since the anterior chamber is, as it were, virtual during intrauterine life."

Soelberg Wells, in 1873, had remarked that, "anterior capsular cataract may be congenital, but is more frequently found in early childhood in consequence of a perforating ulcer. If it is congenital and there are no traces of iritis or of an ulcer of the cornea, it is probably due to some intrauterine arrest of development.

Ammon of Dresden, in 1858, had also called attention to peculiarities at the posterior pole of a congenital nature. He spoke of "an indentation of the posterior capsule, which at times is octagonal, at others quadrangular. Later this disappears, probably through distension of the lens capsule by the growth of the posterior pole of the lens." He adds:

"I do not quite understand the meaning and cause of this peculiar appearance, but it seems likely that it may have some influence on the development of quadrangular congenital posterior cataract."

I have repeatedly pleaded for a more liberal recognition of embryological and non-pathological explanations of many of the opacities found in or around the lens and its capsule, alike at the anterior and posterior poles, and also on the surface of the anterior capsule, either with or without capsulo-iritic attachments. Such recognition of the true nature of these peculiarities has an important bearing on the prognosis of the course that the lesion is likely to pursue, will serve to prevent unfortunate confusion with the products or the processes of disease, and will obviate errors in treatment based on such erroneous etiology.

BLACK CATARACT.

A certain amount of pigment is noticeable in most hard cataracts, varying from a pale amber to dark brown and even black, but black cataract is a *rara avis in terris, nigroque simillima cygno.* Its pathology appears to have been somewhat obscurely treated by most English authors. I find no reference to such variety in Nettleship's *Diseases of the Eye,* a passing allusion merely in Juler's handbook, while Berry observes "often the lens is very darkly coloured, when the cataract is said to be black." If this statement means that black cataracts are often met with, it is at variance with the experience of most oculists. Thus Galezowski says: "Quaint a ce qui me concerne, j'en ai rencontre jusqu a present 9 cas." The *Transactions of the Ophthalmological Society* contain reports of two cases—one by Mr. MacHardy in 1882, and one by Mr. Power in 1885. The latter, in commenting on his case, remarked on "the rarity of this variety of cataract in England. This was the first example he himself had met with."

Mackenzie, in his comprehensive treatise (1854) has an apposite observation on the difficulty of diagnosis of such cataracts. He says (p. 751):

"I have seen a few cases of lenticular cataract in which the opacity was so very dark that, without close examination, the disease might have passed without detection. On concentrating the light on the pupil the opacity appeared striated; such cases have been called black cataracts. I have not seen the lens after it has been extracted in any of these cases."

Accounts of black cataracts recorded prior to the introduction of the ophthalmoscope must be received with reservation, as there is ground for believing that cases of glaucoma, or "amaurosis," or hemorrhage into the vitreous were sometimes so called. Dupuytren had never seen it, and did not believe in its existence; and Delpech, in his great *Dictionnaire* in 1813, doubted the assertion of the ancients that such a form of cataract existed. Janin of Lyons, in 1772, records the successful extraction of black cataract, the first he had met with in 500 operations. He noted that after extraction the capsule became opaque and olive-tinted. J. Scott removed one in 1843 which he says was as black as pitch. Graefe, the elder, diagnosed black cataract in the case of the Duke of Cumberland after other surgeons had diagnosed amaurosis. J. Z. Lawrence had a case, the first in 2,100 patients. Nunneley met with one case in 1,200 extractions. A few other scattered references occur, mostly in foreign authors, the earliest I have come across being that of Rolfink, of Jena, in his *Dissertatio de Cataracta* in 1664.

Four cases have come under my own observation, in two of which I performed extraction. The first was in a swarthy woman with raven black hair. Her vision was reduced to counting fingers, but the pupils looked quite black; though the fundus could not be illuminated, it was only by minute examination with oblique illumination that I could convince myself, by observing fine striae and nacreous lustre, that the defective vision was due to lenticular opacity. I extracted the more mature lens. The operation was uncomplicated, but some weeks afterwards there was a little iritis, though when this cleared up she could read small Jaeger type with a plus 15 D. During the iritis I noticed a very interesting appearance; there were some deposits on the back of the cornea, as in serous iritis; with a strong lens I observed that many of these dots were deeply pigmented.

What is the pathology of black cataract? What is the nature of the pigment? It has been alleged that it is due to "infiltration of haematin into the opaque lens." I do not think that explanation is correct; it certainly will not hold for all cases. I tried soaking extracted cataracts and clear lenses in fresh blood, but found they absorbed haemoglobin with difficulty. Moreover, spectroscopic examination in one of my cases failed to give any evidence of blood pigment. In a case recorded by Hulme, Dr. Harley found that, with HCl and KCNS under the microscope, a red colour was obtained, and that it was to be inferred that iron was present. Hulke examined the lens in Windsor's case, but confessed himself unable to determine the nature of the pigment.

Now I do not think any essential distinction can be drawn between the amber tint of an ordinary cataract when seen by transmitted light and the "black" cataract. Indeed, intermediate examples running through all the shades of a London fog could be found. Now the lens is of cuticular ancestry, and tissues are apt, under certain conditions, which we call pathological, to revert to ancestral habits. The pigment of the negro's skin resides in and is elaborated by the deepest layers of the cuticle. The lens, therefore, contains the progeny of cells whose homologues can produce pigment. *A priori* it would appear not improbable that the pigment is the same in each case. In the outer layer of the optic cup, also derived from epiblast, we have evidence of the pigment-forming capacities of cuticular cells when withdrawn from the surface. Indeed, is not the abundant presence of a form of keratin in the brain a curious chemical testimony to its epiblastic derivation? When these reflections are supported by the fact of the spectroscopic and chemical analyses of the lens pigment differing markedly from those of pigment directly derived from blood, the conclusion may appear to be strengthened that the colour of brown and black cataracts is analogous to that in the rete mucosum, the so-called melanin. Of course, it must not be forgotten that the lens may, in rare cases, be stained by pigment proximately derived from adjacent blood effusion, or that a melanotic sarcoma of the ciliary body may even invade the lens, not to speak of the common attachment of uveal pigment to the anterior capsule consecutive on iritis. That the pigment in question is not any proximate derivative of haemoglobin, but that it is the product of cell activity, like the pigment of hair or of the skin, is, I think, tolerably clear.

THE MATURATION OF CATARACTS.

"Never prophesy unless you know" is advice especially applicable to any speculation as to the rate at which cataracts will mature. Experience may, however, help approximations to accuracy, especially by the careful observation of collateral signs and symptoms. Thus cataracts associated with myopia are prone to slow ripening. Here is a note of an interesting case in illustration:

"When I was clinical assistant to Mr. George Lawson, at Moorfields, I saw a man, aged 85, who, contrary to the habit of out-patients, had preserved and brought with him an old out-patient letter bearing Sir William Bowman's name, and the date July 24th, 1862. The note of that date was: 'Left eye, cataract nearly mature, fingers within six inches; right eye, words of No. 2, myopic.' On September 21st, 1886, under atropin, I noted that the cataracts were partial; in the left there was a very dense white nucleus and cortical striae, occupying all except the uppermost part; likewise in the right the upper part is alone clear. Through these gaps the fundus of each eye could be seen, and, indeed, large posterior staphylomata. Here, then, was a case in which twenty-four years had witnessed scarcely any ripening."

Cataracts beginning at the posterior pole, or by striae, with anterior concavity stretching thence to the equator, are often slow in maturing. There may be some fallacy in this statement, by reason of our estimation of maturity by the amount of clear cortex, through which the iris shadow is cast on the deeper opacity. But allowing for such mere verbal fallacy, I believe that the opacification spreads less quickly through a lens under such circumstances than when the first departure from pellucidity is nuclear or is anteriorly placed. As an illustration of what I mean, and of the rapid influence of iridectomy in accelerating maturation, I may cite the case of a gentleman who was the secretary of a well-known microscopical society:

"He was 51 in 1886, when he consulted me about his eyes; his sight had then been failing for twelve years. His vision was reduced in the left eye to $^6/_{60}$, and with the right eye he could count fingers at 3 ft.; he was unable to use his microscope, which was to him a great deprivation. His lenses exhibited posterior opacities at the pole, and concave striae proceeding arcwise therefrom; there was apparently some axial myopia. The cataracts were in a condition then accounted too unripe for extraction, but ripe enough to excommunicate their unfortunate possessor from most of the pleasures of his life. On October 8th, 1886, I did a preliminary iridectomy on the right eye, and on January 7th, 1887, the cataract to all appearances being perfectly ripe, I extracted it, with a resulting vision of J. 1, and 6/9, with glasses. I had occasion to see the patient again some eight years afterwards, and found the other eye practically *in statu quo,* red reflex could still be obtained, and the anterior hemisphere of the lens was for the most part pellucid. He had resumed his favourite investigations of diatoms with the microscope with the operated eye, and was so well satisfied with it that he would not yield to my suggestion to deal similarly with the other."

This case enforces the slow maturation of cataracts of this class, and their rapid ripening by iridectomy, and indicates the mode of escape from the intolerable dilemma, wherein the lenses are opaque enough to frustrate useful vision, and clear enough to preclude extraction with a clear conscience. An iridectomy performed with this object should be a large one, and the iris should be removed well up to its ciliary border. I have seen disappointing results attend iridectomies done with a view to maturation where these points have not been attended to.

Methods of trituration of immature cataracts with the object of ripening them are not, in my opinion, very advisable. Such methods should certainly be confined to extra-ocular manipulations. I am led to doubt the value of such procedure the more because I have found that the dangers apprehended in the attempted extraction of lenses not largely opaque have been unduly magnified. This opinion is by no means a new one, for I find that Samuel Johnson, writing on October 18th, 1760, to a Mr. Langton, said:

"Mr. Sharpe is of opinion that the tedious maturation of the cataract is a vulgar error, and that it may be removed as soon as it is formed. This notion deserves to be considered. I doubt whether it be universally true, but if it be true in some cases, and those cases can be distinguished, it may save a long and uncomfortable delay."

It is interesting to note both the prescience and the caution which mark the pathological opinions of the great lexicographer.

The Classification of Cataracts.

The ordinary classifications of cataract are hopelessly illogical; it is to be hoped that the practical man, who scorns logic, finds them proportionately "practical." They lack a common *basis divisionis*. Age, consistence, situation, cause, etc., are evoked as bases in the same classification, with a bewildering effect. No mere dichotomous division as into hard and soft, senile and juvenile, is satisfactory. Still less is there any special value in distinguishing between nuclear and cortical cataract, and the existence of laminar cataract makes such division nonexhaustive.

Etiology is doubtless the best basis for classification, but while the pathology remains in part obscure, no complete and satisfactory classification is possible. As an approximation to such an arrangement I would submit the following:

Cataract.

Opacity of lens or capsule attributable to:

1. Developmental causes: (1) Congenital, remains of capsulo-pupillary envelope, dot cataracts, etc., etc.; (2) Infantile —for example, laminar.

2. Cachectic causes: for example, toxaemia: (1) From without—for example, ergot, naphthalin, etc.; (2) from within —for example, diabetes.

3. Secondary results of ocular disease—for example, some

anterior polar cataracts; myopic cataracts; glaucomatous cataracts.

4. Vascular disease—for example, atheroma of carotids, aneurysm.

5. Nervous disease—for example, disease of fifth nerve or of the Gasserian ganglion.

6. Traumatism, direct, or indirect—for example, result of dislocation.

In reference to the toxaemic group, I would associate myself with those who think the influence of diabetes as a cause of cataract has been over-estimated. Von Graefe put 25 per cent. down to this cause. Probably less than 1 per cent. is nearer the truth, and the co-existence of the two conditions does not prove their casual relationship. Atheroma of the arteries is, I believe, a true cause; I remember de Wecker demonstrating the fact in his clinic when I was there some fifteen years ago. Ergotism as an alleged cause is interesting in view of its recognized vaso-constrictive action.

I must now bring these observations to a conclusion. I rejoice to have been permitted to take part in this reunion of earnest students of ophthalmology at the invitation of my old friend and colleague, Mr. Doyne, within the venerable precincts of the University of Oxford. This course of ophthalmology appears to me to have been conceived upon the best didactic methods. We are dealing with a speciality, it is true, but the base of that specialty we are endeavouring to lay on broad, rational and strictly scientific foundations. Dr. Billings, of New York, once wittily said:

"A specialist should be a good general practitioner and something more, but he is very often something else."

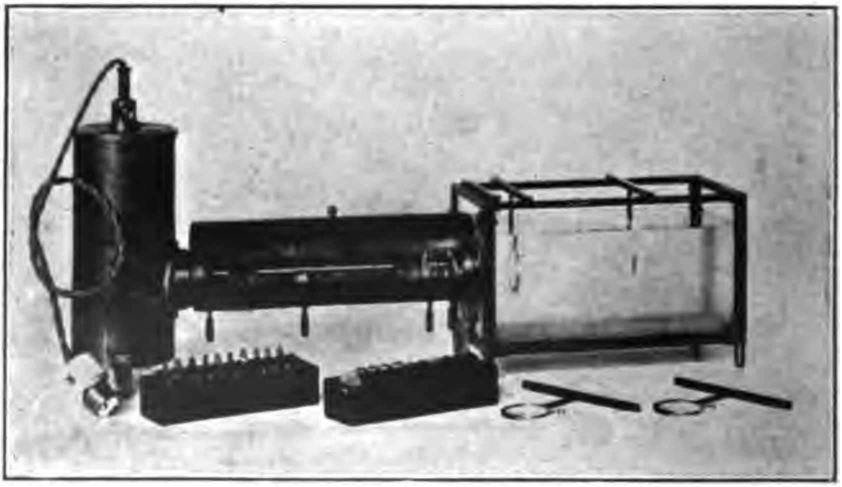
In the ophthalmic specialty there is happily no place for the empiric and the charlatan. Thanks to the completeness with which we are enabled to make our observations on and within the globe of the eye this microcosm has been made to reveal nearly all its secrets. The great discovery of Helmholtz cannot be again repeated; the joy of being the first to behold the living human retina was his alone. He was, indeed, "the first that ever burst into that silent sea." Yet the same principles of research which animated him may inspire us. What were those principles? He tells us in his autobiography:

"I ascribed my success in great measure to the circumstance that, possessing some geometrical capacity, and equipped with a knowledge of physics, I had by good fortune been thrown among medical men, where I found in physiology a virgin soil of great fertility, while on the other hand I was led by the consideration of the vital processes to questions and points of view which are usually foreign to pure mathematicians and physicists."

There is the secret if secret it be. It argues for the unity of knowledge, for the cross-fertilization of the sciences, for keeping the base of all our specialties broad, for the application of the methods of one department of knowledge to the investigation of others, and it behooves us to see to it that all our studies are governed and directed by a whole-hearted devotion to philosophic truth.

REFERENCE.

[1] *Medical Press and Circular* July 8th, 1896. [2] *Lancet,* July 16th, 1894.



A SCHEMATIC EYE. (Reichert).

A SCHEMATIC EYE.

An Instrument for the Luminous Demonstration of the Functions of the Various Parts of the Eye of Normal and Abnormal Refraction and of the Application of Glasses in Disorders of Refraction.*

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(With One Plate.)

1. General Considerations.—In the teaching of physiological optics it has long been recognized that the most effective method is that by which the effects of lenses and their accessories upon the rays of light can be *seen.* Kuehne's artificial eye, designed for this purpose, and now in general use, is an optical model of the human eye in the proportion of 12 to 1. It is in the form of a rectangular box, 18 cm. wide, 18 cm. high, and 50 cm. long. The two ends and the front are of ordinary window glass, and the back, bottom, and framework are of sheet metal. Upon the glass of the left end is affixed a lens in imitation of the cornea, and in the box at appropriate places are placed various accessories in imitation of the crystalline lens, iris, and retina. The eye is filled with water in which is dissolved a little cosin or other highly fluorescent substance. The rays passing through this medium can readily be recognized. The instrument is used in a darkened room, the light being obtained from a heliostat, an arc light, an oxyhydrogen lamp, or other powerful source. The rays are so directed as to fall parallel upon the corneal lens.

By means of the Kuehne model a number of important phenomena can be shown, as, for instance, the first and second principal foci, the optic axis, the optic centre, the effects of convex and concave lenses, cylindrical lenses and prisms; vision without a crystalline lens; the effects of the functional removal of the cornea, as when the eye is submerged in water; the functions of the iris as regards the effects on the quantity of light and the clearness of vision; the effects of the crystalline lens at rest and in accommodation; Scheiner's experiment, spherical aberration, chromatic aberration, entoptic phenomena, etc. Notwithstanding the obvious utility of this apparatus, there remains much to be desired—its cost, its bulk, its weight when filled with water, its liability to leakage, the large lenses and the consequent great danger of injury, the limitations of usefulness owing to structural peculiarities, etc., have of necessity greatly restricted its employment. Owing to such facts the instrument has been modified in various directions, sometimes for the better and sometimes for the worse; but in neither the original nor the modified forms have the possibilities of so valuable a piece of apparatus been developed.

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*University of Pennsylvania Medical Bulletin, Dec., 1905.

II. ELEMENTS OF DESIGN OF THE SCHEMATIC EYE.—In designing the schematic eye which forms the subject of the present article, the most important problems, apart from the purely mechanical, were those in regard to the light and the lenses. The matter of light has been satisfactorily met in the adoption of an ordinary 16-candle incandescent electric lamp, or a Welsbach burner. The question as to the lenses was of greater importance, and, indeed, constituted the most important to be dealt with. For a number of reasons, especially those pertaining to cost and range of usefulness, the "test glass" size, and such lenses only as are found in ordianry test sets used by the ophthalmologists, were adopted. This makes it possible for anyone having a test set to carry out a very wide range of observations.

Inasmuch as the eye is schematic, no attempt was made, as in the Kuehne model, to retain the proportions of the various parts of the human eye.

The apparatus consists of a *projector, a visual chamber* and various *accessories.* (See illustration.)

The *projector* is formed essentially of two cylindrical brass tubes which are affixed at right angles to each other, the one being in the vertical, and the other in the horizontal. In the former, the lamp is placed and so adjusted that the rays are projected through the horizontal tube into the visual chamber. The horizontal tube is cut lengthwise in half, one end of the lower part being permanently fastened to the vertical tube, the upper part being hinged to the lower. In the bottom of the latter are provided a number of carriers for lenses and objects. These carriers can be moved to and fro, as occasion may require, by means of handles which project through a slot. After the insertion of the lenses and object, the upper half, or lid, of the horizontal tube may be closed, thus cutting off diffused light that might interfere with observations. This tube is of sufficient length, in conjunction with the lenses selected, to demonstrate the "near" and "far" points, and, of course, all intermediate points in the visual field.

The *visual chamber* is, as in the Kuehne model, a tank of parallelogram form, but of much smaller dimensions, and constructed upon much better mechanical lines. The framework is of brass, and the four sides are of window glass. The dimensions are 10 cm. in width, 12 cm. in height, and 25 cm. in length. It constitutes a rigid, compact, and very portable instrument. The rays of light, as in the Kuehne eye, can be rendered conspicuous by means of a fluorescent solution. In place of this, smoke is often resorted to. Each has its disadvantages—the former, chiefly in the loss of light; and the latter, in the difficulty, or impossibility, of maintaining satisfactorily during a series of tests a proper degree of density. These objections have been most satisfactorily overcome by a solution of creolin. The visual chamber is filled with water to within 4 or 5 cm. of the top, and in the water is dissolved one or two drops of creolin, which is sufficient to impart a slight milkiness, by means of which the rays of light can readily be traced.

The *accessories* and the problems connected therewith were all carefully studied.

The *field of projection* in the Kuehne eye is of ground glass. While this answers satisfactorily, it is far from being all that is desirable, inasmuch as the image can be seen only through the right end of the eye, thus making observation not only awkward, but generally at a disadvantage. Practical experience soon made it manifest that if the image could be viewed from the front, and from above and from the sides, a great gain would be obtained. After experimentation with various devices, it was found that a piece of sheet brass coated with white enamel is ideal. This offers a perfectly smooth, non-transmissive and non-absorptive field. Both sides are enamelled, but on one side in the center of the field is enamelled in yellow a circular area in imitation of the macula lutea, the importance of which will be appreciated in studies of the deviation of the visual axis, and in the application of glasses. One side or the other may be used as may be preferred in the various observations.

The form of the *corneal lens* was given full consideration. If we were to imitate nature the lens should be concavo-convex; but inasmuch as the eye is schematic, and as the lenses used are to be limited if practicable to the test case set, a biconvex lens of appropriate power was selected. In this connection there also arose the problem as to the *best means of causing* *astigmatism,* that is, whether it would be better to make an exception and depart from the test case set, and to have one or more special astigmatic corneal lenses made, or to make use of the cylindrical glasses of the set. The latter seemed in every way preferable, chiefly because no special and relatively expensive lenses would be required; pedagogically, it seemed that to cause astigmatism by a single cylindrical glass must be more impressive than to have it produced under complex conditions, as, for instance, when the segment of the cylinder is ground on a convex lens; and, finally, the test set makes possible an extremely wide variation in the degree and kind of astigmatism, making easy the production and correction of astigmatic phenomena otherwise almost practically impossible to the ordinary observer.

The method of demonstrating the *mechanism of accommodation* naturally received careful consideration. The photographer, as we know, accommodates his camera to objects near and far by altering the distance between the lens and the field of projection. So simple a plan could be adopted in the schematic eye without departing from what we observe in nature, inasmuch as in certain snakes and amphibia, in osseous fishes, and in cephalopods accommodation is accomplished in this way. Since, however, the especial purpose of the schematic eye is to demonstrate phenomena of the mammalian eye, in which accommodation is effected essentially, and practically solely, by changes in the anterior and posterior surfaces of the crystalline lens, the problem resolved itself into a choice between an alterable lens, such as is used by Fitz in his model to show the effects of changes in the curvature of the lens in accommodation, or two or more lenses of different but properly related values.

The Fitz device is so constructed that the curvatures may be increased or decreased at will, and although very ingenious and satisfactory dioptrically, it is relatively expensive and difficult to maintain in permanent working order. On the other hand, the simple lenses seemed to have almost every feature to recommend them. For general work, two lenses of values to represent respectively the crystalline lens at rest and in full accommodation are all that is necessary. When, however, a test set is at hand, a convex lens of any dioptric value between these extremes may be used, and thus practically every stage of accommodation shown.

In selecting the corneal and crystalline lenses no serious attempt was made to imitate the exact relative dioptric values, but merely to sufficiently approach them so as to give satisfactory illustrations of normal conditions.

The air space and the sheet of glass between the corneal lens and the water of the visual chamber which represents the aqueous humor are departures from normal conditions, but they are not of practical importance in the operation of the instrument.

The *aqueous* and *vitreous humors* are represented, of course, by the water in the visual chamber. To further imitate natural conditions, a movable partition of sheet metal, perforated to admit the crystalline lens, extends across the chamber, thus separating, as it were, the two humors.

The structural features of the *diaphragm* which is to imitate the iris were also studied. Here the choice was between the admirable iris diaphragm so widely used in various kinds of modern optical apparatus, and simple perforated disks of metal. While the former has many desirable and extremely pleasing features, its cost and liability to get out of order under the unusual conditions under which it must be used were strong factors against its adoption. On the other hand, practice has shown that the latter form answers every purpose with entire satisfaction.

Besides the foregoing there were, of course, many details of variable degrees of importance that had to be considered, but it seems hardly necessary to make specific mention of them.

III. Practical Applications in Physical, Physiological, and Clinical Optics.—The schematic eye as thus outlined offers a means for the study of a wide range of optical phenomena, physical and physiological, normal and abnormal. Its adaptability on the clinical side is extraordinary, as is shown by the fact that any disorder of refraction that can be corrected by a test set can be imitated and corrected by the schematic eye. Moreover, one can *see* abnormalities of focusing and their correction. This fact has led me to believe that the instrument will prove of value not only to the student and teacher, but also to the practitioner in the demonstration to patients, in appropriate cases, of abnormalities and their correction.

In the use of the apparatus for teaching purposes it will doubtless usually be found of advantage to study many phenomena of a purely physical character as an introductory to physiological and clinical optics, as, for instance, the refractive indexes of air, water, saline solutions, etc.; the effects of lenses of various kinds; the effects of diaphragms; focal distances, etc. In furtherance of this end, the visual chamber may be filled with smoke, colored water, aqueous solutions of various densities, glycerin, oils, etc. Moreover, by varying the position of the projector in relation to the visual chamber, the rays of light may be caused to fall at any angle upon the refractive medium in the chamber, by simple means of which differences in refraction may be beautifully shown.

The apparatus has been used for the past year in our laboratory and class teaching with great success.

SCOPOLAMIN AND MORPHIN ANESTHESIA IN OPHTHALMIC SURGERY.*

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It is not necessary to dwell upon the self-evident fact that the ophthalmic surgeon possesses no general anesthetic which answers all the requirements for a perfect anesthesia, yet allowing him to have good control of the patient's voluntary ocular movements and not attended with such untoward after-effects as are customary when ether or chloroform is employed. It is with the greatest reluctance that he resorts to general anesthesia for intra-ocular operations when the globe is deeply inflamed because of these facts. Then, too, he often resorts to a general anesthetic because cocain fails to produce the proper anesthesia, by using such quantities as would not endanger the integrity of the corneal epithelium or seriously interfere with the circulation of the anterior part of the globe, thus materially retarding the healing process.

Suffice it to say that a general anesthesia produced by any agent is a source of imminent danger to the life of the patient. It is not at all likely that a general anesthetic will ever be obtained that is free from all dangers, applicable to all patients, and suitable for all operations, either in general or special surgery; for, it is impossible to so disturb the balance between consciousness and complete surgical unconsciousness without profoundly affecting the vital equilibrium of organic inter-relationship of function. Therefore be it understood that scopolamin and morphin anesthesia** has its distinctive drawbacks just as the accepted anesthetics of to-day. The selection of an anesthetic is but a choice of lesser evils, or one offering more of the desirable attributes an ideal anesthetic should possess. For this reason, scopolamin and morphin invites our serious consideration.

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*Medicine, January, 1906.

**It is the hydrobromate of scopolamin which should be employed for these injections, preferably Merck's. Some experimenters, among them Ries, believe they get the identical results with hyoscin hydrobromate. Scopolamin is an alkaloid from Scopolia carniolica—so named after the Italian botanist Scopoli. There seems to be a diversity of opinion as to whether it is actually identical with hyoscin. If not identical, it is at least isomeric. The U. S. P. regards them as identical in their physiologic action. Some chemists maintain that hyoscin always contains scopolamin. Both are hypnotics, and the dose of either is 1-150 to 1-100 of a grain.

Briefly, the dangers of this anesthetic mixture depend more upon the toxicity of its components and the inherent ability the patient possesses to withstand toxic agents of this kind than upon any other factors. It seems that in patients in whom trouble was encountered it could largely be ascribed to the rather large dose of morphin in this mixture. The patient gets proportionately a larger amount of morphin than scopolamin—*i. e.*, receiving within a very short time nearly the maximum dose of one and the extreme physiological dose of the other. As yet the physiological lethal dose of scopolamin remains undetermined.

The physiological action of scopolamin, according to Steinbuechel[7] (Schmerzverminderung und Narkose mit specieller Berucksichtigung der kombinirten Scopolamine-Morphium Anesthesia—Leipzig, 1902), is as follows:

1. Small doses raise blood-pressure by stimulating the vasomotor nerves. Larger doses lower it by influencing the cardiac excitomotor mechanism.
2. The pulse is usually slowed a trifle, but is ordinarily not influenced by small doses. Large doses cause a vagus pulse.
3. The cerebral cortex is rendered less excitable when stimulated by the faradic current. Sleep is induced, but not analgesia.
4. Respiration is not influenced by small doses. Large doses slow respiration.
5. The sweat, mucous, and salivary secretions are markedly diminished.
6. Mydriasis occurs in many instances—*i. e.*, when not instilled into the eye.
7. The motor-end apparatus supplying the intestine is paralyzed, and the tone of the splanchnic is increased.
8. It is excreted by the kidney.

Kochmann[8] is in virtual accord with the findings of Steinbuechel, and further says that the fatal intravenous injection is not known. He failed to produce death in a dog after an injection of 0.09 intravenously.

Given alone, scopolamin does not produce analgesia, but when combined with morphin an anesthesia is obtained usually sufficiently profound to execute any operation an ophthalmic surgeon might wish to undertake.

The injection of this combination does not always completely obtund the sense of touch; yet it reduces this sense so profoundly that by the addition of a drop of a five-percent. cocain solution complete surgical anesthesia of the eye is obtained.

As to morphin, Crile[19] has definitely proven that it greatly lessens the intensity of the various afferent nerve impulses going to the vasomotor center, because of the peripheral nerve stimulation; for this reason, the tendency to shock is reduced. Since scopolamin in small doses markedly raises blood-pressure by stimulating the vasomotor nerves, thereby materially aiding in minimizing shock, the combination of the two drugs seems a happy one. Indeed, Schneiderlin* (May, 1900), was the first to appreciate this fact, having successfully employed this mixture as an anesthetic for operations upon the insane[1]. Since then Blos[8] and Korff[14] have greatly improved and modified the dosage as well as the manner of administering it. Their method is as follows (employed by Ries[10], Israel[16], Zinke[12], and others):

Scopolamin hydrobromate ......gr. $^1/_{50}$.
Morphin sulphate ....gr. $^1/_2$

Carefully dissolved in 3 drachms of distilled water.|| The patient having been prepared in every detail as for the giving of any other anesthetic, one Pravaz syringeful of this mixture is injected into the arm two and a half hours prior to the specified time set for operation; the second syringe is given one and a half hours prior, and the third syringe half an hour before the specified time. It is desirable that perfect quietness surround the patient, as this materially hastens the induction of profound sleep. Though the patient apparently seems in the first stages of anesthesia about ninety minutes after the first injection, he still can be roused and will coherently answer questions. Because of this it is inadvisable to unduly disturb the patient, and hence it is good practice to have the patient upon the operating table when the third injection is given.

Shortly after the first injection the patient becomes sleepy and drowsy; after the second profoundly drowsy and sleepy; while at the time of giving the third injection he is scarcely sensitive to pain, though somewhat actively sensitive to touch. Half an hour after the third injection usually complete anesthesia obtains. Should this not be the case, then but a minute quantity of chloroform or ether, administered in a very restricted

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*Schneiderlin used scopolamin extensively as a hypnotic among the insane patients, and used it to counteract the evil effects morphin has upon the pulse and blood-pressure.

||Scopolamin in solution is not very stable, therefore a fresh one should be made for every anesthesia.

manner, is requisite. In fact, with a small amount of ether or chloroform an almost indefinite narcosis can be maintained. In view of this fact scopolamin and morphin injections are a decided advantage in ether or chloroform narcosis, as the stage of excitement is practically eliminated.

For ophthalmic operations oftentimes but two injections will answer, provided one or two drops of cocain are instilled into the eye. By this procedure you can comfortably and safely operate upon painful glaucomic eyeballs without inflicting any pain; and yet, the patient, though apparently comatose, is able to turn the eye in any desired direction, and hold it there. This sometimes holds true after three injections, but not as a rule, as after the third has taken effect the patient is practically in the surgical anesthetic stage. Often the patient scarcely feels any pain, but still retains the sensation of touch shortly after the second injection. It is this long-continued acute sense of touch which interferes with operations in this stage—the constant flinching of the lids and the unconscious rotating of the globe when the forceps are applied. It is not until the third injection is given that this sense of touch is sufficiently reduced as not to be a menace if you do not wish to employ cocain during any stage of the operation.

Ries[10] is experimenting with injections of the separate respective doses of scopolamin and morphin at alternating intervals to see whether complete anesthesia can be produced. It seems that the combination as at present employed, though it produces analgesia, can be materially improved upon as regards quantity in order to further minimize the attending risks. Experiences of others so far show that this anesthetic is safe in patients who have albumin and other organic changes in the urine. Indeed, in one of my patients I absolutely refused to give ether or chloroform because of the excessive amount of albumin associated with valvular heart lesions, and yet the scopolamin and morphin caused no apprehension at any period. Ries has had the same experience in a great number of patients with urinary changes. Because of the stimulating effect of the scopolamin upon the cardio-vascular system, patients with cardiac irregularities seem to act nicely under this anesthetic.

The patients scarcely ever realize that they have been removed from their bed, and seldom complain of postoperative pain. On the contrary, they enjoy peaceful rest all the way from fifteen to twenty-four hours after the operation. This readily appeals to the ophthalmic surgeon, especially when in addition the patient seldom if ever vomits, retches, or restlessly tosses about, thus not interfering with the primary agglutination of the corneal wound. There practically is no stage of excitement in giving this anesthesia. It is not as useful in the young as in the adult. The former do not tolerate with as much safety such large doses of scopolamin and morphin, given within so short a period of time.

The application of this anesthesia in a modified form as suggested is acceptable in cataract operations upon nervous and restless patients. Though according to Blos hysterical patients do not respond very nicely, yet Ries, Schneiderlin, Israel, and others have not found this to be clinically true.

The deaths reported (Flatau,[8] Israel,[16] Dork,[17]) cannot be directly ascribed to the scopolamin or morphin, as in all of them rather large quantites of chloroform were simultaneously administered. In all of the cases chloroform was at least an accessory. In three of Dork's patients the extreme age, 69 to 76, and other causes were held accountable. Israel lost one patient on the table, and two others died several days later, yet he does not specifically ascribe their death to the scopolamin or morphin. It seems that the addition of rather undue amounts of chloroform increases the toxic effects of the morphin (Monod [18]). Some patients have an idiosyncrasy for the scopolamin just as they can have for atropin. In such instances no harm is done, as not more than one injection need ever be given before the idiosyncrasy manifests itself, the patient having received but the physiological dose of each, 1/150 and 1/6 grain respectively.

This form of anesthesia appeals to ophthalmic surgeons, because of the rather unusual muscular relaxation supervening even after a single injection, which is so desirable for intraocular operations. Even after the second injection the patient is still sufficiently conscious to explicitly obey the orders of the surgeon, in itself a valuable feature. This anesthesia is desirable in that class of operations wherein cocain does not produce the requisite anesthesia, and where ether or chloroform narcosis is a decided detriment because the surgeon loses control of the voluntary eye movements of the patient. Then, too, it is the long period of continued rest which is an exceedingly efficacious feature with this anesthesia.

A careful perusal of the literature and case reports by those who have employed scopolamin and morphin anesthesia will demonstrate:

1. That there is practically no stage of excitement even if ether or chloroform is employed.

2. That small quantities of ether or chloroform will main-

tain prolonged anesthesia; but great diligence needs be exercised in administering the latter.

3. That frequently operations can be satisfactorily performed without resorting to the addition of chloroform or ether.

4. That seldom, if ever, is there any muscular rigidity; on the contrary, an extreme relaxation ensues.

5. That there is an almost complete absence of the annoying, distressing, and often disastrous effects which frequently follow a narcosis.

6. That urinary or cardiac abnormalities offer less apprehension than when ether or chloroform is given.

7. That patients rally from this anesthetic not by shock or emotion, as often occurs with ether, chloroform, and particularly with ethyl chlorid, but they have a peaceful awakening.

The unstinted praise accorded this scopolamin-morphin narcosis for general surgery by such men as Ries, Israel, Dork, Semon, Whitacre, and others tempted me to employ it in those instance in which cocain usually fails to answer the purpose, and in which the voluntary rotation of the eye by the patient is a decided benefit to the operator, *e. g.* acute glaucoma, cataract extractions in nervous and excitable patients, and for keratectomy combined with Schoeller-Kuhnt's graft and enucleations. So far I can heartily indorse the opinions of the general surgeon.

This anesthesia has its limitations, but what narcosis has not? Then, too, the method is comparatively new and our mode of administering this mixture is not altogether faultless; therefore a final opinion cannot be legitimately pronounced. Up to the present date perhaps not more than 3000 anesthetics have been given with but six recorded deaths, and these are directly attributable to its effects. Nevertheless, the scopolamin-morphin narcosis, either pure and simple or as an adjunct for ether and chloroform, certainly appeals to surgeons and is worthy of their extended trial before condemning it. In a measure it is in its developmental stage.

BIBLIOGRAPHY AND REFERENCES.

1. Schneiderlin: Aerzt. Mittheil, a. u. f. Baden, No. 10, May, 1902.
2. Kochman: Therapie d. Gegenwart, May, 1903.
3. Flatau: Munch. med. Wochschr., No. 28, 1904.
4. Volkman: Deut. med. Wochschr, p. 967, 1903.
5. Blos: Braun, Beitrage z. klin. Chirurgie, vol. xxxv.
6. Baker: Arch. f. klin. chir., vol. xxxv.
7. Steinbuechel: Schmerzenverminderung u. Narkose mit specieller Berucksichtigung der Kombinirten Skopolamin-Morphium

Anesthesie, Leipzig, 1903.

8. Hartog, C.: Die Aether-Narkose, in Verbindung mit Morphium-Skopolamin Injectionen.

9. Blos, E.: Munch, med. Wochschr., No. 46, 1903; Beitrage z. klin. chir., Bd. xxx, 1902.

10. Ries, Emil: Scopolamin-Morphin Anesthesia. Annals of Surgery, Aug., 1905.

11. Seelig, M. G.: Scopolamin-Morphin as an Adjuvant in the Administration of General Anesthesia. Annals of Surgery, Aug., 1905.

12. Zinke, E. G.: Scopolamin and Morphin Anesthesia; Report on 13 Cases. Cin. Lancet-Clinic, Nov. 4, 1905, p. 518.

13. Monod, M.: Report of an Almost Fatal Case with Scopolamin and Morphin Anesthesia. Jour. de med. de Paris, Sept. 24, 1905.

14. Korff: Berl. klin. Wochschr., p. 882, 1904.

15. Tuffier: Gazette med. de Paris, No. 8, 1905.

16. Israel: Deut. med. Wochschr., No 10, 1905.

17. Dork: Ibidem, No. 10, 1905.

18. Robertson: Medical Record, Jan. 9, 1905.

19. Crile, Geo. W.: Blood Pressure in Surgery (Lippincott Co., Pub.).

20. Semon: Munch. med. Wochschr., p. 1231, 1903.

21. Grevsen: Munch. med. Wochschr., No. 32, 1903.

22. Wiesinger: Deut. med. Wochschr., 1904, p. 1335.

BILATERAL LYMPHOMATA OF THE LACRIMAL, PAROTID AND SUBMAXILLARY GLANDS, DUE TO TONSILLAR HYPERTROPHY AND CONSEQUENT SUB-OXIDATION.*

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Symmetrical enlargement of the lacrimal and salivary glands of a non-inflammatory and non-painful type was first described by Mikulicz in 1888[1], and again in 1892[2]. The condition is a rare one, and but few cases have since been recorded. The case herewith presented, when first examined, was a typical example of this unusual disease. It possessed a further interest because of the peculiar etiology, and because of the simple surgical means taken for its relief.

On January 13, 1905, Agnes M., colored, aged 18, came to my clinic at the Wills' Hospital for the relief of a swelling over each eye, which had begun about six weeks before, and was of a chronic indolent character. She had not suffered any pain, nor had there been noticed any redness or other sign of inflammatory disturbance. The vision was quite normal, both for distance and for near. Although she had not had any severe illness, her general health was below par, and for some years past she had suffered from a continuous succession or series of "colds in the head" during the winter season. She was a confirmed mouth breather, and notwithstanding her color, showed considerable pallor and lowered oxidation.

Examination showed both lacrimal glands symmetrically enlarged, prominent, slightly lobulated, and firm. They were easily exposed by simply pressing the lids upwards, when they at once came into view. They were not tender to palpation, and were non-adherent, the skin moving freely over them, and the subjacent tissues being free. There was a slight drooping of the upper lid at the external canthus, but not sufficiently marked to be considered true ptosis.

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*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

[1] Berliner Klin. Woch. 1888.

[2] Billroth's Festschrift. 1892.

The parotids were only moderately enlarged, and not very freely movable; not at all painful or inflamed, but very hard to the touch. The submaxillary glands on the other hand, were very much enlarged, but less firm on palpation. The cervical chain was not involved, and there were no other glandular enlargements.

Examination of the mouth and pharynx showed marked dryness of the lips, due to mouth breathing, but no buccal lesion. She had, however, a marked granular pharyngitis, and excessive hypertrophy of the tonsils of a soft relaxed nature. These enlarged tonsils wholly filled the post-pharyngeal space, causing great respiratory obstruction and consequent oral breathing. Considerable adenoid vegetation was noted in the nasopharynx.

Rhinological examination showed hypertrophy of the inferior turbinates in both nostrils, while in the right there was caro luxurians or granulation tissue on the septum, and adhesions between the septal tubercle and middle turbinate. On the left side there was a large hypersensitive septal puff. Added to this was a persistent antral cystitis of both nostrils, the discharge from which was very irritating.

The patient was so markedly a mouth breather that the case was diagnosed as one of suboxidation with entanglement of subkatabolic products in the lymphatic glands. The hypertrophied tonsils, having existed long before, were considered the gross offenders and excision was decided upon. The antral cystitis was also a prominent factor, and this virulent secretion was probably absorbed through the antral lining and carried thence to the enlarged lymphatic chain. The patient was directed to report for operation at the earliest possible date.

Three days later, January 16, 1905, a double tonsillectomy was performed and the adenoid vegetations mildly curetted. All medication was withdrawn in order that the full effects of increased oxidation might be allowed to manifest themselves. The throat healed rapidly. The intra-nasal condition showed marked improvement, and free nasal breathing was re-established. The first retrogressive symptom was a gradual shrinkage of the submaxillary glands. The parotids being denser showed a slower reduction, while the lacrimal glands promptly returned to their normal condition.

The increased breathing power has caused a commensurate improvement in the general health. The circulation and body heat is much better, she needs less protection from the weather, and her constant cold has disappeared. The nasal swelling has been much reduced, and the antral secretion is again non-irritating.

No portion of the enlarged glands was removed for microscopic examination, because such a procedure might have encouraged the tendency to resolution, and it was not desired to interfere with nature's processes, except through restored physiologic functions.

The literature of this subject has recently been carefully reviewed by Shoemaker[3] before the Ophthalmological Section of the Philadelphia College of Physicians, and also by Cutler in the last volume of the Transactions of the Ophthalmological Society[4]. No detailed report of the respiratory conditions seems to have been mentioned, although dryness of the lips and nose, and the buccal lesions, were referred to. It is a coincidence worthy of note that the cases recorded by these two writers and my own have all occurred in negroes of the female sex.

The etiologic factors most commonly recorded in this condition have been, (1) bacterial infection, chiefly through the mouth; (2) lymphoid activity due to some unknown agent in the blood; and (3) idiopathic origin. Whether a further examination of these cases would have revealed similar respiratory conditions I cannot say, although I would naturally suspect it. My case certainly showed a marked interference with respiration extending over a long period, and through this lowered oxidation resulting in a condition of katabolic stasis. It is a well known fact that suboxidation and consequent subkatabolism not only to interfere with physiologic functions, but that their products are positive irritants to organized tissues. Wakefield[5]' holds that "the excess of these products in the blood is responsible for the irritation effects upon the tissues of the economy; not merely the nervous tissue, but all of the tissues which react to it in accordance to their specific peculiarities, namely the soft tissues by atrophy, the fibrous by hypertrophy."

No specific bacteriæ have been found in these cases, the microscope usually revealing lymph cell infiltration of the interstitial tissue.

Twice previously I have had the opportunity of demonstrating that suboxidation was the cause of glandular enlargement.

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[3] Annals of Ophthalmology. July, 1904.
[4] 1904.
[5] American Medicine. April 1, 1905.

One of these cases had been diagnosed as sarcoma by several well known surgeons, but the re-establishment of normal respiration by a nasal operation caused rapid and complete resolution of the supposed sarcomatous growth.

The remedies usually employed in Mikulicz' disease are arsenic, the iodids and pilocarpin. The first acts almost wholly by its oxidizing action on the blood, while the two latter act similarly by stimulating healthy lymphatic action, thus increasing oxidation. The usual treatment, therefore, has for its objective aim the stimulation of oxidation, and hence is quite in the line with the therapeutic suggestion which the etiology of this case furnishes. It is not at all surprising, therefore, that this patient became quite convalescent in a little over two months, through the simple restoration of nature's functions, without the exhibition of any internal medication or other remedial measures.

REPORT OF A CASE OF PRIMARY TUBERCULOSIS OF THE CONJUNCTIVA.

BY J. J. THOMPSON, M. D.

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NEW YORK.

I take the liberty of reporting the following case on account of the rarity of the condition, the apparently absolute proof of the correctness of the diagnosis, and its favorable outcome.

The patient, a young lady, 24 years of age, presented herself for treatment on account of a swelling of the right pre-auricular gland. In addition to this she said her right eye had felt peculiar for the past four weeks, but had not given her sufficient discomfort to cause her to seek relief, and on inspection only the slightest swelling of the upper lid was noticeable. On turning the upper lid a single round ulcer about 2 mm. in diameter was found in the center of the tarsal conjunctiva. Its edges were clear cut, and its base was clean, which I believe to be unusual in tubercular ulcers of the conjunctiva. It presented more the appearance of a chancre, except that there was very little induration surrounding it. Later a very small ulcer made its appearance about 1 mm. from the original one.

No family history of tuberculosis could be obtained, and the patient presented neither signs or symptoms of the disease. There had been no sweats or elevation of temperature, no cough, and she had not lost weight recently. A careful physical examination of the lungs showed no signs of pulmonary tuberculosis, and no bacilli could be found in the sputum.

Owing to the peculiarity of the ulcer, and the fact that apparently there had been no local traumatism, or any cause other than an infection of a specific nature, the diagnosis seemed to lie between tuberculosis and primary syphilis, and to positively demonstrate which, required considerable care.

The ulcer was thoroughly scraped, and the scrapings examined for tubercle bacilli, but none were found. An injection was also made into the peritoneum of a guinea pig. In the meantime the pre-auricular gland had continued to enlarge, and was enucleated, and submitted for microscopical examination. The report was as follows: "The section from the pre-auricular gland shows several typical anatomical tubercles, with a fair number of giant cells." Up to this time, with the exception of the curettage, the ulcer had received no treatment and the patient was watched for signs of secondary syphilis, but none appeared. In view of the findings in the gland, it was deemed best to thoroughly remove the surrounding tissue, to prevent spreading, and to obviate the danger of a general infection, if such did not already exist. This was done, and the usual regimen for tubercular patients ordered. On the twenty-fifth day after inoculation, the guinea pig began to refuse food, and emaciated rapidly, dying on the thirty-fifth day of general tuberculosis. The lungs, liver, and spleen were studded with tubercles.

The ulcer progressed favorably, and in about two weeks was entirely healed. During the past few months repeated physical examinations have not shown any signs of tuberculosis, and the young lady has gained seven pounds in weight.

This case showed some points at variance with those usually found in conjunctival tuberculosis, especially the rapidity and completeness with which healing occurred. On this basis alone, if the laboratory reports were not so conclusive, I would have always doubted the correctness of the diagnosis, but with the ample corroboration which we were fortunate enough to obtain, I think it can hardly be questioned. It is a singular fact that the condition is most frequently found in young persons, especially about the age of puberty, although I have never seen any explanation as to why the conjunctiva should be more vulnerable at that time than during any other period of life. It is also unusual to find the disease so localized. In this case, with the exception of a very small ulcer, no tubercles, or other traces of the disease could be found in the surrounding tissues, and on that account I am inclined to consider the case one of primary infection produced by abrasion of the conjunctiva by some foreign substance, rather than a deposit carried by the blood stream. According to the experiments of Valude, the tubercle bacilli will not penetrate the conjunctival epithelium while it is intact. Total extirpation of the infected nidus where such is possible seems to afford the best results in the way of treatment, although when healing does not occur promptly following its removal, the X-rays should be carefully used.

A CASE OF SUBHYALOID HEMORRHAGE.

With Remarks on the Source and Anatomic Situation of this Variety of Intraocular Hemorrhage.

By James Moores Ball, M. D.,

ST. LOUIS.

(With One Plate.)

J. W. M., male, aged 40 years, was referred to me by Dr. J. W. Hamilton, of Mt. Vernon, Ill., on January 20, 1906.

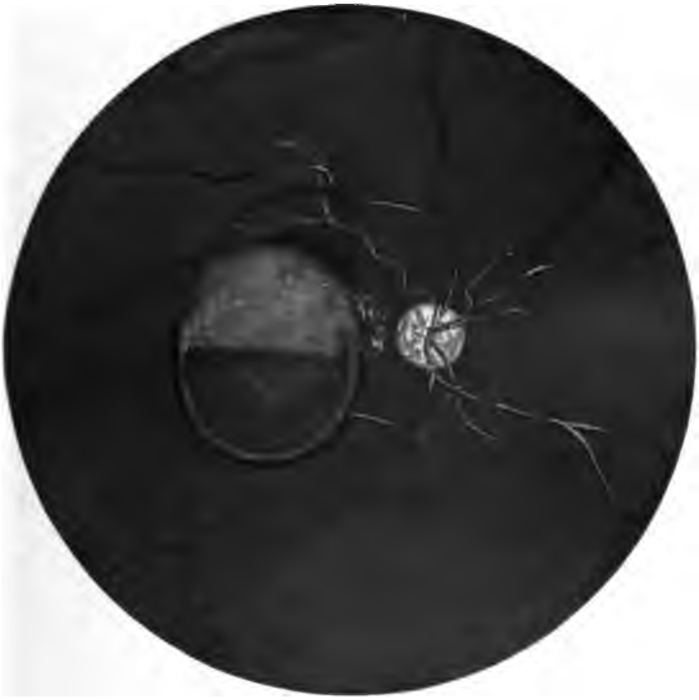
Patient states that his right eye has always been defective. He has never been able to read with it. He could see large objects but has no definite recollection as to the amount of vision with this eye. When 13 years old he had an attack of conjunctivitis. During his school life his eyes gave him no discomfort; he had no blurring of vision and no headache. In his 17th year he became a bill clerk in a grain elevator, which position he held for one year. He then followed blacksmithing for six years. For two years of this period he was engaged in "flue-welding," which was very trying on his eyes, because of the close attention required in observing white-hot metal at close range (about four feet). This exposure caused no pain but produced failure of vision, reading becoming impossible without the aid of glasses. Sixteen years ago the patient abandoned blacksmithing and engaged in the laundry business.

The present trouble began three weeks ago with blurring of near vision. His glasses were changed by an optician to +1.50 for each eye. On January 9, 1906, during a "coughing spell," occurring in the morning, the patient's right eye became suddenly and completely blind in the direct line of vision, although at the inner and outer sides he had perception of light. For about two hours the color of the obstruction was totally black; then, when looking at a gas jet, it appeared to be blood-red; at the present time objects look foggy. Vision gradually improved reaching: V. R. E=fingers at 4 feet.

Patient has had one mild attack of rheumatism about 20 years ago. He has never had syphilis. His father was killed by an accident. His mother died at the age of 53 "from dropsy and an ovarian tumor."

When the patient visited me (January 20, 1906), V. R. E.= fingers at 4 feet; V. L. E. = $\frac{20}{15}$. Under a mydriatic (atropin) V. R. E. = fingers at 2 feet; V. L. E. = $\frac{20}{100}$ With glasses: V. R. E. with + 8.00 D. = $\frac{7}{50}$ V. L. E. with + 2.50 D. = $\frac{20}{15}$.

Ophthalmoscopic examination shows the left eye to be normal. The right eye presents, in the lower temporal quadrant of the fundus, a large hemorrhage which evidently is undergoing resorption. This blood area is shaped much like the



SUBHYALOID RETINAL HEMORRHAGE. (Ball).

letter D turned 15° to the right. Its upper internal extremity is separated from the optic nerve-head by a space of 1 papilla-diameter. It is bounded below by a red crescent which is separated from the main body of the clot by a grayish white line. In this respect the case I report is different from any one described in the literature. The body of the hemorrhage does not now involve the macula, although it probably covered the macula originally, as is evidenced by the presence of a grayish white area situated above. Scattered alongside the vessels above the clot are a number of small white round areas of retinal degeneration. Throughout the area of the hemorrhagic placque the retinal vessels are invisible. The general color of the clot is a dark brick-red. In places it approaches a lighter color, notably above where absorption seems to be progressing rapidly. By direct ophthalmoscopy I found the central area of the hemorrhage to be hypermetropic 4 D. The urine was examined with negative result.

Patient returned February 3, 1906. V. R. E. with +8.00 D.= $\frac{12}{60}$. The hemorrhage had diminished about 25 per cent. in area.

Source and Anatomic Situation.

The exact source of this variety of intraocular hemorrhage and its anatomic situation are important points, on which, however, no general consensus of opinion exists at the present time.

Nettleship[1] speaks of the condition as "a single very large extravasation (which) occurs on the surface of the retina beneath the internal limiting membrane from rupture of a large retinal vessel, probably a vein." In another place, while apparently referring to these cases, he states that: "Very large hemorrhages, many times as large as the disk, sometimes occur near the yellow spot, and probably all the layers then become infiltrated, while sometimes the blood ruptures the anterior limiting membrane of the retina and passes into the vitreous."[2] Commenting on Morton's[3] case, Nettleship gives his opinion that the arrangement of the essential structures in the region of the macula accounts for hemorrhages of this character affecting that situation in preference to any other.

Berry [4] describes subhyaloid hemorrhage as an effusion of blood from the retina, spreading out "in a thin layer between the retina and the vitreous without passing into the latter." He calls attention to the "dense central scotoma which passes off, entirely or nearly so, after the lapse of several months." He states that the pathology of the affection is not clear.

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[1] Nettleship: Diseases of the Eye, Philadelphia, 1900, p. 246.
[2] Ibid., p. 235.
[3] Morton: Trans. Oph. Soc. of United Kingdom, Vol. IV.
[4] Berry: Diseases of the Eye, Philadelphia, 1889, p. 269.

On the other hand Hotz[5] argues strongly that the perfect restoration of vision in these cases is a sufficient proof that the blood is situated in front of, and not in or behind the retinal layers.

In a paper which is notably clear in its descriptions, and explicit in its remarks, Hotz describes and discusses three cases which had occurred in 20 years' practice. His opening sentence is so appropriate that I will quote it:

"Of all the hemorrhages occurring in the interior of the eye the effusion of blood between the retina and vitreous is the most interesting kind and deserves our special attention; for as this effusion usually spreads over the region of the macula it causes a sudden and complete loss of vision, which naturally frightens the patient in no small degree."

Frost[6] describes the condition as an extravasation beneath the hyaloid membrane. He argues for the situation between the retina and hyaloid membrane on clinically and ophthalmoscopically observed facts. He states that it has been suggested that these hemorrhages are chorioidal and not subhyaloid. "The evidence, however, in favor of their being subhyaloid is very strong," as follows:

1. The sharpness of outline of these hemorrhages is not consistent with extravasation into a tissue like the chorioid; furthermore the patients complain of seeing objects as through a red veil, which leads one to believe that the blood must be anterior to the layer of rods and cones.

2. The color of the extravasated blood being nearly that of the vessels, it is not easy to determine the relation of the latter to the hemorrhage. He then cites Morton's[7] case in which the area of extravasation became white after several months and was then distinctly seen lying in front of the retinal vessels.

3. Frost endeavors to controvert Silcock's[8] view that in his case, where the straight edge of the hemorrhage was directed obliquely downwards, the blood was in the chorioid, by saying that the shape and outline of the extravasation are against its being contained in the interstices of such a tissue as that of which the chorioid consists.

Lang[9] argues for the subhyaloid position on account of the complete obscuration of the retinal vessels at the edge of the extravasation; the red blurring of objects as seen by the patients, and the common existence of a scotoma. He quotes de Wecker as authority for stating that a hemorrhage of the chorioid will cause no such scotoma. As to the central situation he accepts Gunn's explanation of a potential cavity in the macular region, owing to the more feeble attachment of the hyaloid membrane to the retina here.

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[5] Hotz: Annals of Oph. and Otology, Vol. II, No. 1. (Jan., 1893.)
[6] Frost: The Fundus Oculi, Edinburgh & London, 1896, p. 169.
[7] Morton: Transactions Oph. Soc. of U. K., Vol. IX, p. 145.
[8] Silcock: Transactions Oph. Soc. of U. K., Vol. VII, p. 176.
[9] Lang: Transactions Oph. Soc. of U. K., Vol. VIII, p. 155.

Haab[10] speaks of these cases as hemorrhages between the retina and the vitreous body, and refers to Leber[11] who took a similar view. Haab relates six cases, all from a clinical point of view.

Fuchs[12] in the second American edition of his text-book, describes these hemorrhages as preretinal and the text is unchanged in the ninth German edition.[13].

Fick[14] does not mention subhyaloid hemorrhage. Norris and Oliver[15] say that, "In some rare cases large hemorrhages, after escaping from the fibre-layer, find their way between the retina and the hyaloid, and spread out as a concave sheet over the face of the retina. Such hemorrhages, even when they invade the macular region, may be entirely absorbed without any impairment of vision."

Gibbons,[16] in speaking of retinal hemorrhages says: "When they occur at the macula they produce an irregularly oval blotch with its long axis vertical. If the hemorrhage is large and of a drop-like form it is as a rule situated between the internal limiting membrane of the retina and the hyaloid membrane of the vitreous."

Holmes Spicer,[17] in an early communication, mentions the difference of opinion as to the seat of the lesion. He considers these hemorrhages to be venous in origin on account of their spontaneous arrest and the turgidity of the veins. He regards the extravasations as too large to be capillary. Recently in a syndicate book,[18] to which he contributed the chapter on diseases of the optic nerve and retina, Spicer states that the hemorrhage is on the retina beneath the hyaloid membrane. He mentions Fisher's observations, of which I will speak presently, and adheres to the view that the blood comes from a vein.

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[10] Haab: Beitrage zur Augenh. Heft v. 1892.

[11] Leber: Graefe-Saemisch Handb., Band v, 553.

[12] Fuchs: Text-Book of Ophthalmology, New York, 1899, p. 443.

[13] Fuchs: Lehrbuch der Augenheilkunde, Leipzig und Wein, 1903, s. 518.

[14] Fick: Diseases of the Eye and Ophthalmoscopy, Philad., 1896.

[15] Norris & Oliver: A Text-Book of Ophthalmology, Philadelphia, 1893, p. 448.

[16] Gibbons: The Eye, New York, 1905, Vol. II, p. 443.

[17] Spicer: Royal London Oph. Hosp., Reports, Vol. XIII.

[18] Posey & Wright: Diseases of the Eye, Nose, Throat and Ear, Philadelphia, 1903, p. 430.

A recent work on the eye by Hansell and Sweet[19] does not mention subhyloid hemorrhages.

As far as I am aware, in only one instance has a histologic examination been made of an eye with subhyaloid hemorrhage. This was in the celebrated case of Mr. J. Herbert Fisher,[20] of London. His investigations indicate that in his case the blood escaped from a minute vessel, and detached the internal limiting membrane from the retinal layers and spread in the space thus formed.

Fisher's patient was a woman, 60 years of age, whose vision failed suddenly when she was at laundry work. She had severe expistaxis, March 13 and 14 (1895), requiring admission into the St. Thomas' Hospital. Her father died of tuberculosis and her mother passed away in a "fit." It is unnecessary to give all of the history. Suffice it to say that April 30, 1905, she was admitted to Lawford's eye clinic. Vision= hand movements, but cannot count fingers. Ophthalmoscopic examination showed a large subhyaloid hemorrhage. Its upper border, on a level with the optic disc, was sharply defined and gray; its lower border was less regular and had a fringed appearance. The retinal vessels over the affected area were completely obscured. Below the main patch and in connection with the inferior macular vein, was another patch of extravasated blood, less sharply defined and much smaller than the central one. Otherwise the fundus was normal.

L. E. with + 5.00 D. gave V. = 6/9.

On May 14 V. R. E. = fingers at 2 feet.

On May 28 V. R. E. = fingers at 3 feet.

She had several uterine hemorrhages between these dates.

She died May 31. Temperature just before death, 106.4°.

The autopsy showed cerebral hemorrhage. The left lateral, third and fourth ventricles contained blood-stained fluid. Left motor tract in hemisphere was infiltrated with blood. The microscopic examination of the affected eye showed the following changes:

A double membrane was seen running over the surface of the blood. The membrane nearest the blood showed nucleated cells in connection with it, while the other membrane was structureless. The first was evidently the internal limiting membrane of the retina and the second was the hyaloid membrane of the vitreous. The two membranes ran practically parallel with a minute interval between them, and both were on the surface of the extravasated blood. At one place a small number of blood corpuscles was seen between the two membranes, which at this spot were dissociated; here the blood had apparently broken through the internal limiting membrane of the retina but had been checked in its passage toward the vitreous by the hyaloid membrane. At the end of the section furthest from the optic nerve the blood had burst through both membranes, and had spread itself out for some distance as a thin layer on the surface of the hyaloid membrane. The retinal layers were not infiltrated. The section gave no clue as to which of the retinal vessels was the source of the hemorrhage.

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[19] Hansell & Sweet: Text-Book of Diseases of the Eye, Philadelphia, 1903.

[20] Fisher: Ophthalmic Hospital Reports, Vol. XIV, p. 291.

Fisher concludes that subhyaloid hemorrhage should be classed under the head of retinal hemorrhage.

Blood is apparently poured out from a retinal vessel, does not involve the retinal layers, but detaches the internal limiting membrane from their surface and accumulates in the space so formed. It may break through not only the internal limiting membrane but also the hyaloid membrane and thus pass into the vitreous humor. Though the specimen proves nothing in this direction, it seems probable that to tear off the internal limiting membrane from the retina would require blood and moderate pressure from a minute artery.

Fisher holds that blood from a vein would be insufficient to cause this separation. He believes that the possibility of estimating the surface of the hemorrhage to be hypermetropic seems doubtful.

Parsons,[21] whose recent book on the pathology of the eye is a standard authority, has this to say in speaking of retinal hemorrhages: "The larger hemorrhages may be limited by the hyaloid membrane, as in the typical subhyaloid hemorrhage, or they may burst through into the vitreous, tearing up and destroying the retina, and forcing the vitreous and lens forward, thus causing a secondary glaucoma."

Etiology.

Subhyaloid hemorrhage is a rare disease. Hotz[22] met with three cases in 20 years' practice. The case which forms the text for this paper is the first one I have recognized.

Eales[23] has recorded four cases. He considers the disease more common in males, attributing the comparative immunity of females to the relief afforded by menstruation. His views are not in harmony with those of other observers.

Spencer Watson[24] relates a case of subhyaloid hemorrhage in a woman at the climacteric. Hotz's[25] first case occurred in a woman 42 years of age, who, while menstruating, stood with bare feet in very cold water. The menses ceased and two days later, while working over embroidery, she became dizzy and soon was blind in the left eye. Five weeks later vision was normal.

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[21] Parsons: The Pathology of the Eye, Vol. II, (Histology, Part II), p. 571, N. Y. 1905.

[22] Hotz: Annals of Ophthalmology & Otology, 1893, p. 6.

[23] Eales: Birmingham Medical Review, July 1880, p. 262.

[24] Watson: Transactions Oph. Soc. of U. K., Vol. I, p. 41.

[25] Hotz: Annals of Oph. & Otol., Vol. II, 1893, p. 6.

In this connection A. Hill Griffith's[26] experience is worthy of record. In an experience comprising 6500 cases seen in private, and a large but unstated number in clinical practice, he found 14 examples of subhyaloid hemorrhage. Ten cases occurred in females and 4 in males. In this period the total number of cases of retinal hemorrhage was 83, classified as follows:

41 cases of retinal hemorrhage;
20 cases of hemorrhagic retinitis;
14 cases of subhyaloid hemorrhage;
8 cases of vitreous hemorrhage.

Thus it is seen that 16 per cent. of cases of retinal hemorrhage observed by Griffith were of the subhyaloid variety. This is certainly an unusual experience.

Doyne's[27] case occurred in a man, Lang's[28] in a boy, and Mellinger's[29] in a man. Of Hotz's[30] three cases, two occurred in women. Thomas's[31] patient was a young woman with delayed menstruation.

Obermeier's[32] case is unique. His patient received a fall upon the back of the head, followed by subhyaloid hemorrhages in both eyes. The effusions were large and reduced vision to $\frac{2}{50}$ and $\frac{1}{60}$ respectively. Nine months later the blood had been absorbed and vision was normal.

Ziegner[33] reports a case of idiopathic hemorrhage between the retina and vitreous humor in a 52-year-old man. The clot was completely absorbed in 3 months, following the repeated subconjunctival injection of physiologic salt solution.

Prognosis.

Of all the varieties of retinal hemorrhage the subhyaloid is the one which gives the most favorable prognosis, both as regards the restoration of vision and the life of the patient.

In conclusion, the writer wishes to thank Dr. W. E. Fischer, of St. Louis, for making a sketch of this fundus, and Dr. Mortimer Frank, of Chicago, for looking up references in the Newberry library.

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[26] Griffith: Lancet, August 6, 1904.
[27] Doyne: Trans. Oph. Soc. of U. K., Vol. VIII.
[28] Lang: Ibid.
[29] Mellinger: Zeh. Klin. Monatsb., Vol. XXIV, p. 404.
[30] Hotz: Annals of Oph. & Otol., 1893, p. 6.
[31] Thomas: Ophthalmoscope, July, 1905.
[32] Obermeier: Klinische Monatsb. fur Augen., March, 1901.
[33] Ziegner: Berliner Klinische Wochenschrift, April 1, 1901.

THE "EXAGGERATION" AND HOBBY-RIDING OF THE EYESTRAIN THEORIST.

BY GEORGE M. GOULD, M. D.,

PHILADELPHIA.

One of the most common and ancient of the methods of ignoring and denying new medical truths, discoveries, and progress, is to call their advocates "cranks," "exaggerators," "enthusiasts," "hobby-riders," "theorists," "extremists," "grinders of their own axes," etc. These flattering epithets are so pleasing to the epithet-makers, and the consciences of these gentlemen are sometimes so suspicious that the epithets are incorrect, that the honorary titles usually appear in unsigned editorials, reviews, and in other allusive and elusive places and ways; thereby one is prevented from answering and bringing refutation home to one person's judgment. Lately, however, one confrere has boldly said these things to me in a personal letter. To him I sent the following reply. I publish it because my correspondent's attitude of mind is so representative, so precisely that of many who seek or assume to be "leaders" of professional opinion and practice. As that attitude of mind is peculiarly misleading, as it is wholly unprofessional (i. e., not for the good of the profession), I think that the falsity of every one of its false statements should be exposed. As these statements are not founded upon reason, they will not convince their irrational makers, but one may possibly prevent the hardening of some of the minds of the young into illogic dogmatism and prejudice.

(Copy.)

Mr. dear Dr. ....:—

Epitomizing your unkind letter of January 15, 1906, I find that directly, or by implication, you charge me with the following blunders, mistakes, professional sins, and crimes:

1. That, contrary to my view, heterophoria produces disturbing symptoms which cannot possibly be relieved by simply correcting the refraction.

2. That "some of my statements are extremely loose when considered from a scientific viewpoint;" that I have "a disregard for the powers of observation of other medical men," have a tendency to confound theory with fact (truth), a bias toward a pet idea; that I am an "extremist," "faddist," "hobbyist."

3. That "they do not forget," and you plainly imply that I do forget, "that there are other things besides eyestrain that may produce headache; that indigestion, chorea, epilepsy, etc., are often due to other things than eyestrain.

4. That I have "too generously" charged an indefinite number of ophthalmologists with sordid motives.

5. That, "every skillful, conscientious, careful ophthalmologist, as you well know, is affording relief to many patients who have suffered from headache of various forms, from certains forms of dyspepsia, choreiform movements, etc., etc."

6. These, you say, are anxious for the truth and fearless in its promulgation when they are satisfied of its genuineness. "They do not think it wise to assume positions that are not tenable," and lastly, that while "we must cry the truth from the hilltops, if necessary, we must be careful that untruth is not voiced."

I will take up these charges seriatim:

1. At the time of the meeting of the Pan-American Medical Congress in 1892, Tenotomy not only for strabismus, but for heterophoria, was at the zenith of its vogue. Everybody seemed to be clamoring to be operated upon for the most evident symptoms of simple ametropic eyestrain, and almost every oculist was as eager to attempt the tenotomies, graduate, undergraduate, and postgraduate. Before the Ophthalmic Section of the Congress I hazarded my little reputation by protesting that this operative treatment of heterophoria was wrong, root and branch wrong; I followed my extempore statements by articles (*Medical News,* October 14, 1893, and November 18, 1893), and later by an article in the *Journal of the American Medical Association* of November 1, 1902, directed against the operative treatment of strabismus. It is at least an odd coincidence that from 1892 and 1893 the tenotomania of American oculists except in one or two instances, has steadily waned, until now comparatively few rarely tenotomize for heterophoria, and many have abandoned the practice entirely. The vast majority of oculists in civilized countries would laugh at your contention that such operations are necessary. They would charge you with indiscrimination, hobby-riding, or at least with extremism. How would you answer them?

I understand that you would not justify the action of one of your ——— colleagues, who operated on a patient, finally coming to me two or three years ago ,about twenty-eight times, and, as a result, the man had little or no power of any kind over coordinated ocular movements. All the 'phorias, like Hans Breitman's barty, had disappeared *in die Ewigkeit.* Nor of another, in which the conjunctiva had been snipped seventeen times, the "operations" having been designated as "tenotomies." My question remains: What have you done, in the interests of discriminating, and in rebuking "extremism," toward lessening the evils of tenotomomania? For fourteen years I have, in a large private practice, found no case in which I have thought it advisable to tenotomize for heterophoria. Possibly, I am not so discriminating as you, possibly you are not so discriminating as I; possibly, also, I am not so successful as you in relieving "the symptoms" you say cannot be relieved except by operation. I think I do relieve. I have nothing to regret in my course, however, in this respect, and at least your right to lecture me upon the matter may be questioned; "the end of all this pother is you think one way, I another."

2. I might also answer your second objection with the two lines from Browning just quoted, but it is best to go into detail a little.

At the Buffalo meeting of the American Academy of Ophthalmology, etc., held September 14-16, 1905, you said that perhaps 50 or 75 per cent. of migrain was caused by eyestrain, but that 25 or 50 per cent. was *not* thus caused. In your letter you now say that "every skillful, conscientious, careful ophthalmologist, as I well know, is affording relief to many patients who have suffered from headache of various forms, from certain forms of 'dyspepsia,' choreiform movements, etc." Now you should well know that this incriminates thousands of oculists and by implication is most glaringly inexact and untrue. With hardly a single exception there is not an ophthalmologist in continental Europe who would not charge you with the same sins of "extremism," "faddism," and "hobby-riding," with the same "extremely loose statements from a scientific viewpoint," which you lay at my door. To this thousand ophthalmologists must be added another thousand in England and the United States, who, by no means will consent to be called "unskillful," "unconscientious," and "careless." There could be no clear and indubitable implication than this that you have as decided a "disregard for the powers of observation of other medical men" as have I. I say so bluntly, and you by "inpinuendo." I do not think that frank statements are more dishonorable and unprofessional than roundabout implication. I say they are less so. Dr. Pagenstecher and Company, you know, speak of us and of our entire contention (50 or 75 per cent. admitted by you) as "Amerikanische Humbug." What would your colleague, Dr. ———, the most famous ophthalmologist in ———, think of your admissions noted above? What would Dr. ——— of ——— think, or Dr. ——— of ——— and many others I might mention? How would you answer their charges of "extremism" and "loose scientific statements?" They scarcely believe a word of what you say is true as to dyspepsia, chorea, and headache. What have you done to convince them of the error of their ways? To the vast majority of oculists of the world you are an extremist almost as guilty as I, and their indiscrimination is but a shade more reprehensible than yours. Why does the pot have such pleasure in charging the kettle with blackness? Have you not the same "disregard for the powers of observation" of these medical men as you aver I have? Do you not also confound theory with fact (truth)? Have you not a fault of "bias toward a pet idea?" Is your claim for yourself of a better scientific mind than has been given me a proof of anything more than the dogmatism of conservatism, and the unwilingness to change opinion in deference to the logic of progress and discovery? By what right do you put yourself above me, and pose as a model of scientific precision? To be safe, you should admit no part of what I claim, because the true "conservatives," such as Drs. Dana, Knapp, Fisher, Berry, Pagenstecher, Fuchs, and the rest (men who have put themselves publicly on record), are waiting with hungry eyes to rend you.

And I wish to protest against your indiscriminating cruelty, in callously stigmatizing another as an extremist, a faddist, or a hobby-rider. These are old names, applied from the beginning of medical civilization to those who sacrifice themselves for the coming truth. You must know how quickly they blast the fortunes and imperil the success, even the livelihood, of rising young men. To those who want no honors, who scorn to chicane for offices and fame, who disregard, and who must often contemn both "leader" and "leadership," who are strong enough to get and to hold practice without hospital positions, or presidencies, or chairmanships, or professorships—to such, this, your way of dubbing one as an unscientific extremist, is contemptible and may be answered with a sneer. To those not so strong, these epithets bring cowardice and stultification, and a pitiful, worthless success. A genuinely kind, or a genuinely scientific mind would refuse to bolster preconceived opinion and established error by such an ignoble method.

3. You say that I contend that "headache, indigestion, chorea, epilepsy, etc.," are solely due to eyestrain. By this you seem to place me under the logical necessity of charging you with egregious stupidity or willful misrepresentation. It is horrible to accept either necessity, and I therefore beg you to withdraw the words, for I cannot be impaled on either horn of the dilemma. There is not a line in all my writing that says or implies that "indigestion, headache, chorea, epilepsy, etc.," are solely and aways due to eyestrain. I must beg you to be discriminating, not "confound theory with fact (truth)," not to be "an extremist," not to make "extremely loose statements," and not to "assume positions that are not tenable;" do be "careful that untruth is not voiced." It is impossible for me to think you have read my writings and then be able to make such a statement. To say that all headaches, indigestions, choreas, and epilepsy are due to eyestrain would be to write one's self down a fool, with whom no controversy would be possible or advisable. To say that I have said or implied such folly is to show the worst inaccuracy, and sin

against me, that you say I commit "too generously" against other oculists. Do you go on the assumption that it is not necessary to be discriminating, accurate, and scientific toward *me?* Extremism and truth are subjective.

4. Possibly I have sinned in ascribing "sordid," inethical and selfish motives to "an indefinite number of opthalmologists." I shall certainly keep on sinning, however, so long as the facts remain which demand it. Your extremism and unscientific inaccuracy have led you into a common but crude error. Every close student of medical sociology well knows that in the professional ranks is an abundance of scamps and quacks possessing the doctorate degree. If you have not noticed the fact, many of your confreres have, and your lack of perspicacity does not disprove it. Now you are in error if you think that leadership, so-called, or the getting of fame, honors, professorships, etc., make physicians any more ethical. I am inclined to think that these acquirements may be, and indeed frequently are, got by means that thousands of more scientific intellects and more sensitive consciences would, and do, wholly refuse to use. You may find it best for personal reasons to court, or to give, the favor of patents of nobility to these scamps in high and in low places. I find myself incapable of doing so. Those who know anything of history or psychology know that the self-elected guides, "leaders" and judges, most of the text-book makers and editors, the professorial and consultant classes, have scarcely ever made medical discoveries, have, as a rule, not allowed them vogue, and have martyrized those who brought the new truth to recognition and realization. You prefer to belong, at least one-half belong, to the class of Hodge and Meigs, as against O. W. Holmes, the class of the persecuting, life-wrecking "brethren" of Semmelweiss. Members of this class, such as Dr. —— of ——, —— of ——, ——, ——, —— of ——, are not moved to their work of ignoring or of destructive criticism simply because of dogmatism and prejudice, but by other evident reasons. Dr. ———, in a review of my books in the official organ of the American Medical Association, misrepresented and misquoted them, and went so far as to say I contended that cancer is due to eyestrain. Another solemnly avers that I believe that all headaches, indigestion, choreas and epilepsies are due solely to eyestrain. Is there any man that would not rather be charged with scoundrelism than with idiocy?

5. You say that every skillful, conscientious, careful ophthalmologist, "as I well know," is affording relief to patients who have suffered from headaches, dyspepsia, choreiform movements, etc.

In this sentence is a *petitio principii* unworthy of a scientific and accurate, at least a non-extremist mind. Of course every ophthalmologist who is skillful, conscientious, and careful is performing these cures. I not only admit it, but reemphasize its truth with all my heart. But you imply, and I deny, that all oculists are skillful, conscientious, and careful. There are perhaps 5000 hospitals and dispensaries in the United States with Ophthalmologic Departments, each of these with staffs of professors and clinical assistants. You know that these clinical assistants are young, inexperienced, and usually wanting in one or more of the qualities of skillfulness, conscientiousness, and carefulness. You know you would not trust your wife or child to their care. It is they who do the refraction. You also know that some or many of the oculists established in practice in our country are often as unskilled, conscienceless, and careless. You know that there are many M. D.'s attendant upon and in the employ of the "eyes-examined free" opticians. You are also aware of the fact that there are many other kinds of quacks and rascals in the profession, and posing as "specialists in diseases of the eye." You cannot be ignorant of the fact that patients passing through the hands of other refractionists before coming to you, show you prescriptions and lenses which are incorrect, ludicrously wrong, and which never could have been correct. You know that there are nearly a hundred conditions of accurate refraction which are too commonly ignored, even by famous oculists, usually more ignored by the famous than by the unknown. The peculiarity of my practice for some years has been the consultation by patients who have passed through the hands of other refractionists. It is a daily experience to find them with glasses as incorrect as if the patients had picked the spectacles out of a bushel basketful of an optician's odds and ends. Yesterday a patient with four diopters of astigmatism and high anisometropia came to me wearing, from a famous oculist in your city, simple spherical lenses, alike in the two eyes. His six prescriptions by others were as absurd. A general physician of Philadelphia writes me that his patient had found no relief from obvious eyestrain reflexes from eight oculists, and the ninth, whom he compelled him to consult, cured him instantly. I was not one of the nine, so do not smile!

Not only this, but also further: You cannot have failed to see that a large number of American oculists do not believe in your theory that relief of patients suffering from headaches, dyspepsia, and chorea, is possible by glasses. The famous Dr. ——— told me he had examined thousands of patients suffering from these similar diseases, and had found no error of refraction whatever. Do you believe such nonsense? There are many who share his belief. And besides this you are aware that in all Europe, except by two or three men, such a possibility of curing these diseases in this way is not held worthy of attention except by a sneer and shrug. If your theory of the etiology of some, of many, of these diseases is true, it should be seriously, and in detail, set forth in the text-books on diseases of the eye. Is it even mentioned by most of them? I fear you are not discriminating and scientifically accurate. You appear to be an extremist, and a hobby-rider.

6. These careful and conscientious and skillful men, you urge, are "anxious for the truth and fearless in its promulgation, when they are satisfied of its genuineness. But they do not think it wise to assume positions which are untenable." Can you say this while looking at yourself steadily in the mirror, and not laugh outright? Truth, you aver, "must be cried from the hill-tops if necessary, but we must be careful that untruth is not voiced." These statements are to me so loathsome that I can hardly answer them with becoming equanimity and courtesy. As you make yourself their mouth-piece, as you speak for so large a class holding the same views, I must briefly direct your attention to their iniquity. At the Buffalo meeting referred to, you spoke your sentiments about as follows:

"Perhaps 50 or 75 per cent. of migraine is due to eyestrain, BUT I WISH TO PROTEST WITH ALL MY POWER AGAINST THE **PERNICIOUS ERROR** THAT **ALL CASES** ARE DUE TO THIS CAUSE!! SUCH STATEMENTS ARE **PROOFS OF EXTREMISM AND HOBBY-RIDING!!!**"

This manner of expressing your theory is shared by many "leaders," "ophthalmic surgeons," and especially by the editors of the official organs of medical societies, and of commercial (medical) journals. One must ask for details:

a. When did you, or when did those sharing your opinions, you middle-of-the-road men, when did you show yourselves "fearless in the promulgation" of the half-truth you admit? When did you "cry this truth from the hill-tops?" When will it become "necessary" for you to do so? For 20 or 30 years others have been proclaiming this truth, and so far as I can judge, during this time you were wholly ignoring and silent. Even now you are—in double caps—interested only in great care that the untruth shall not be voiced, and unconcerned about the truth you admit—in diamond type. Is it a cunning shrewdness, or a pitiful neglect, to wait until the growing acceptance of the truth compels a putting one's self on record? Politicians, in such circumstances, speak of "climbing into the band wagon before it is too late." Records of the *Transactions* of 20 years' work in great or little Ophthalmic Societies are gleaned in vain for demonstrations of the "proclaiming from the hill-tops."

b. Is not the positive truth of more value scientifically and therapeutically than the negative limitation? Why is your interest so intense in the limitation and so low and anemic in the tremendously valuable positive truth?

c. The crux of the matter lies in the supreme difficulty of the art of accurate refraction. When have you careful men, admitting part of the truth, shown zeal and demand that the multitude of the sources of error in diagnosing eyestrain and prescribing lenses therefor, should be brought to a perfection rarely witnessed? Only through scientific and long courses of study in optics, physiologic and pathologic, can the student become "skilled, conscientious and careful." Do the desirable and necessary optical schools exist? Why not?

d. When and where, and how often, have you met the sneers and ignorings, the denials and contempt of your colleagues, the great ophthalmologists of the world, who laugh at your contention that our specialty can relieve "headaches, dyspepsia, choreiform movements, etc.?"

e. Fifteen years ago I began to advocate the truth that eyestrain is a causal factor in the production of many diseases of the digestive organs. Year after year I have continued to hammer out articles and give clinical proofs of this theory. When did you, or your fellow critics of me, begin to help toward the acceptance of the theory? You now say dyspepsia may be due to eyestrain; why did you let me fight alone for so many years? Why do you now say nothing as to this history of the discovery? Why do you not remonstrate with all the makers of text-books on the diseases of the stomach and intestines, not one of whom speaks of the matter? Why do you not thank me for the truth gained instead of lecture me on my extremism and hobby-riding? My theory of the origin of lateral curvature of the spine is a great discovery. When will you begin to investigate it, and when acknowledge that there is *some* truth in it?

f. Lastly, why the utter lack of interest in the millions of suffering patients whom you condemn to a continuance of their ill-health because of your tremendous emphasis of the 10, 25, 50 or 75 per cent. you say are *not* curable by glasses? Your commercial (medical) journals have unanimously howled at me, *Danger, Danger! Extremism! Nothing but harm can come from such exaggeration!* You reecho their inane and senseless cry. There are to-day, even in our own single country, millions of patients suffering from "neurasthenia," diseases of the digestive organs, and nervous and cerebral disorders of a hundred kinds. Some, often a large, proportion, you admit, grudgingly admit, may be, and are due to eyestrain. Where is the "danger," the "unwisdom of assuming untenable positions," the flagrancy of "carelessness that this untruth be not voiced," from the simple trial of a pair of lenses? These patients are proverbially incurable; all the neurologists and gastrologists cannot help these hopeless sufferers. Will the gastrologists and neurologists and the professors and the consultants and the far-away country physicians, try to relieve the small or the large percentage of their patients by scientific spectacles, unless you join in promulgating the truth from the hilltops and forget your quibbling and emphasis as to the small percentage not due to eyestrain. This is a new gospel. Come over into Macedonia and help us!

If only you could see that your position is simply an illustration for the millionth time of obedience to a fatal psychologic law of your mind, and that the objective facts do not motive or condition your logic! If you could see that you love your so-called science, which is confessedly unscience, more than you do the relief of myriads of unhelped patients! You and I and our profession should not, do not, exist for "science," or for abstract truth, but for concrete therapeutics, individual cure, and the future prevention of suffering. The world does not care, does not need to care, whether or not you "save your face," justify your past opinions, or your present prejudices. We exist for better things, for beneficence, at least for benevolence. One day's "science" is the error of a later day, but the will to help, the wish to relieve pain, the love of patients, overtops all narrow demands for a fluctuating and contradictory exactness of creed or scientific dogma.

By holding to my *belief*—the result of experience—in the method of cure which I advocate I have cured thousands who would have gone out of my office unrelieved. I prefer my facts to your theories. The limitations you emphasize so uselessly and dogmatically really limit your ability to cure. I should like no better work in the world, if I had not already all the patients I want, than to take the refused and unhelped patients that Dr. ———— & Company turn daily away from their doors—and turn away because they prefer operations, professorships, to stand well with their like-minded fellows, to be held careful, scientific, "conservative." The conservative is one who usually succeeds in conserving error and—himself. I prefer to cure one case unhelped by "science," and unrelieved by conservatism, to all the reputation and self-satisfaction gained by the self-flattery of being held scientific and conservative. If your mind is attentive to the science and the conservatism you will not cure as you would if you are single-eyed and single-hearted to give every sufferer the benefit of the doubt. No one has ever explained how it is "dangerous" to give the million sufferers this "benefit of the doubt."

It is only the logical and the inevitable result that those who cry most loudly or contemptuously against the extremism of the eyestrain theorist, should be precisely those who do the poorest and most inaccurate refraction work. If they did their work correctly they would long ago have seen their patients cured, and would have joined the ranks of those who know. Only last month a patient came to me from a distant city with a history of 25 years of intense and constant misery with frontal headache, intestinal fermentation, constipation, etc. His local oculist, the last one, told him repeatedly and emphatically that his frontal headache was *not* due to his eyes, that he must get that idea off his mind. The patient returned to the oculist, saying that his headache must be due to his eyes, and quoted some patient of mine. Again there was the assurance that it was not the fault of the eyes,—adding that "Doctor G. allows his hobby to get away with him." Now the point of the story is that the man was wearing incorrect glasses, and that correct ones gave him immediate relief of all his symptoms. I shall soon publish reports of many such cases, the moral being that those who complain most of the hobby-riding of "the eyestrain crank," are precisely those whose glasses are most incorrect, who, therefore, do not cure so many of their cases as they should; thus they demonstrate that their skepticism is the consequence of their inexpertness. As of old, deeds are followed by faith. They who do the will of ophthalmology shall learn of the doctrine. In a practical way there is no such thing as "science" and "truth." The least knowledge of the history of science, and especially of such an inexact, and fluctuating science as medicine, quickly demonstrates that there is no resting with acquired truth. The attainment of one generation, of one decade, must be supplanted by that of another. Progress may build on the certainty of the past, but at once the new progress makes the old certainty an almost colorless and useless thing. Even the most solidly founded, most universally admitted truth of modern science, the atomic theory, has been almost undone within the last year or two. In therapeutics and etiology, surely, we are learning that an acceptance of the average opinion, reliance upon the concensus of most generally accepted belief, is folly, and that even the trust in so-called ethics and professionalism, may go too far. If I can cure my patient only by the decried and unscientific and "inethical" remedy, I shall surely cure him in that bad way, because the standards of democratic averages, of common consent, of ethics, and the rest, vary and change, but kindness and benevolence never change. Medicines may fail, but Medicine will not fail. Say what we will, medical practice is far more empirical than scientific, and the hobby-riders and exaggerators are the discoverers of empiricism. The only doubt is as to the certainty of the "facts" and the "cures" of the "unscientific empiricist," but that doubt cannot be lessened or resolved by any cry of "hobby-riding," "extremism," etc., or by any sneer of the self-satisfied.

POSTSCRIPT.

After the proofs of the foregoing had been returned to the printer, the following letter was received from a representative general practitioner. It is such a capital finger post, in two directions, that I cannot withhold it:

"My dear Doctor Gould:

Your article on *A Case of Neurastheuia, etc.,* moves me to write to you. I have been a sufferer from eyestrain from boyhood. (I am now 48 years of age.) I know *by experience* of the suffering that may be caused by errors of refraction, and of the relief afforded by their correction, first by you in 1888, and afterwards by others. Without this relief your words might now be to me as they evidently are to very many others—"hot air."

I wish to show you the effect upon the general physician of poohpooh, "exaggeration," etc., especially when coming from an ophthalmologist. My oculist in this (western) city has been very kind and good to me and has personally given me relief by glasses. On a recent visit I happened to speak of you and your writings. Instantly there was on his part a disposition to poohpooh. It was not extreme, but it was enough to shake my confidence in the man, as one fitted to practice his specialty—a confidence never before shaken.

These questions have arisen within me: How many are there of this kind? What will they do? Continue to poohpooh, and charge you with being a hobby-rider? Will they go on this way until the general practitioner, losing confidence in them, forsakes them as consultants? or will they "see the error of their ways," and go and learn, etc. Keep up the fight! Of course it is discouraging, etc.

My objects in quoting these portions of this letter are to suggest, first, the humor of the posture of the ostrich hiding his head, according to the fable, in the sand. Second, that the hour has arrived for throwing off the inherited and clumsily assumed attitude of what my correspondent calls "poohpooh" and exaggeration-crying. I have had innumerable letters of similar import from general physicians, and all show that they are concluding to "do their own thinking hereafter," and that that thinking is not by any means according to the habits and desires of so-called "conservative" ophthalmologists. I am of course aware that both you and I are heaven-high above any "appeal to the galleries!" We would not think of sacrificing a bit of our awful love of truth, of exactness in scientific matters, in order to secure the good will of the plebeian general practitioner who may have patients to send by and by. Sacred Science depends upon us and upon our strict conformity to truth—what we have so far found to be truth—therefore—.

And behind both of us, the specialist and the general physician stands another most important party to the controversy—the intelligent public. He is also learning to "do his own thinking." To a rapidly increasing degree he is finding out that the criers of "exaggeration" have not been good guides. Of course it is maddening, and all that, but you must remember that it was the intelligent patient, 30 or 35 years ago, who taught the oculist, who taught the neurologist, (who later got sick headache over his blunder) all in a most amusing-House-that-Jack-built manner. This great truth, far greater in its reach than I have ever suspected, was a discovery of the poor afflicted laymen patient. A wise unknown and unhonored oculist, was quick enough to recognize, in the poor twilight, a little of the direction and told another Upon the whole ophthalmologic and neurologic, and surgical worlds, the truth has been forced against their wills. To strike an average, to quibble about percents, to half-accept, half-reject, and all the rest, will no longer avail. The general practitioner has awakened and the public is asking angry questions.

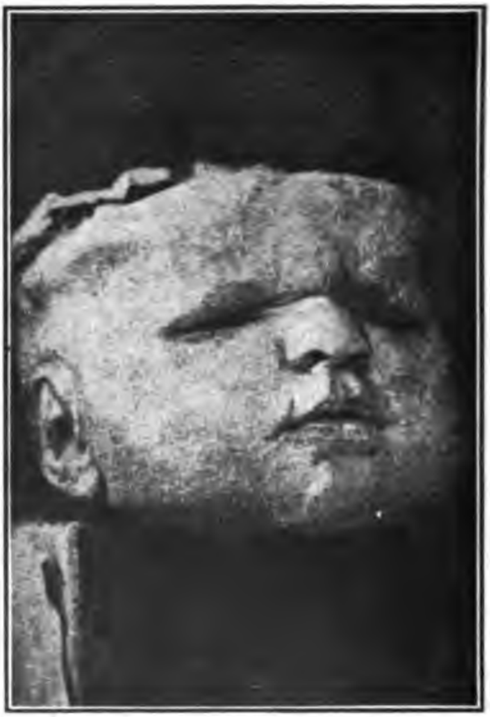

Fig. 1.

A CASE OF BILATERAL ANOPHTHALMOS. (Ovio).

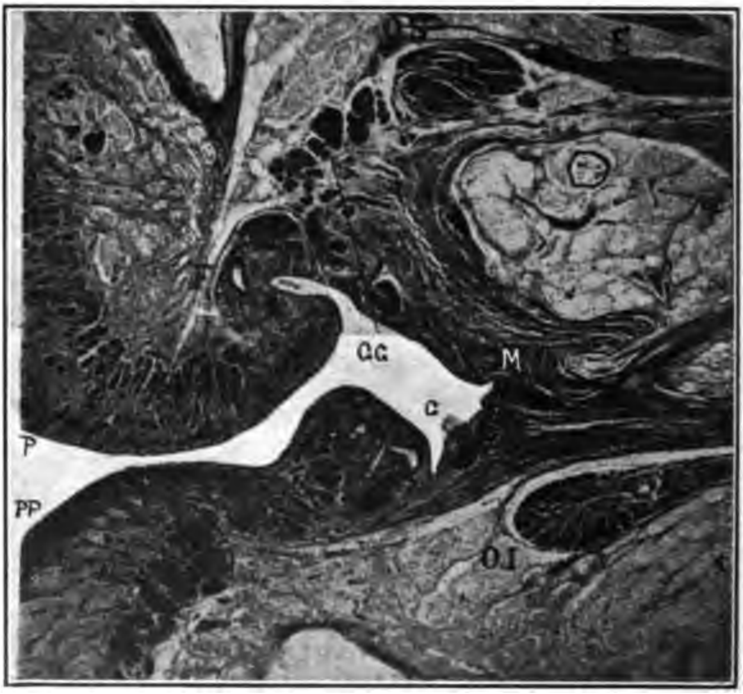

Fig. 2.

A CASE OF BILATERAL ANOPHTHALMOS. (Ovio).

PP. Lower lid.
P. Upper lid.
G. Acino-tubular glands of Krause.
GG. The lobules of the lacrimal glands.
F. The orbito-palpebral aponeurosis.
M. Tenon's capsule.
E. Levator palpebrae superioris.
OS. Superior oblique.
OI. Inferior oblique.

A CASE OF BILATERAL ANOPHTHALMOS.*

By Professor G. Ovio,

IN CHARGE OF THE EYE CLINIC OF THE ROYAL UNIVERSITY OF PADUA.

TRANSLATED FROM THE ITALIAN BY V. L. RAIA, M. D., PROVIDENCE, R. I.

(With Two Plates.)

We have to do with a fetus born at full term of gestation and dead a few days after birth. The head on which the obstetrician had noticed the anomaly called Anophthalmos was carefully preserved. At the macroscopical examination (see Fig. 1) we observed the lids well conformed but indrawn as in enucleated eyes. The palpebral fissure, somewhat narrower than normal measured 16 mm. Separating the lids the conjunctiva formed a funnel-shaped canal with the apex toward the inner side of the orbit. The lacrimal puncta were normally situated. No traces of eye-globes could be found either under the form of a small nodule, or of a pigmented spot. There was no other anomaly externally on the rest of the body. The orbital contents showed only the presence of the different muscles well developed and of numerous glands surrounded by an abundant connective tissue either loose or fibrous. Fig. 2 is the picture of an antero-posterior section of the orbit along its axis and shows clearly what we have already said. *PP* indicates the lower and *P* the upper lid: *G*, the acino-tubular glands of Krause: *GG*, the lobules of the lacrimal glands independent for arrest of development: *F*, the orbito-palpebral aponeurosis; *M'* Tenon's capsule shrunk in which the tendons of the recti muscles end; *E*, the levator palpebrae superioris; *OS*, the superior oblique; *OI*, the inferior oblique. From the inspection of the orbital contents we deduce that ours is a true case of bilateral anophthalmos, which must be added to the few already recorded in medical literature. The brain was found smaller than normal, but well formed; the convolutions were normally developed, including even those of the occipital lobes.

Having accurately separated the brain from the base of the skull it was observed that the optic nerves, the optic tracts, and the external geniculate body were totally wanting. The anterior corpora quadrigemina were greatly reduced in size; the chiasma was completely absent and near the sella turcica; a loose fibrous tissue entering the optic foramen represented vaguely the direction which the optic tracts ought to have had.

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*La Clinica Oculistica, Oct. 1905.

The roof and the external walls of the orbit were removed, the periosteum was carefully separated from the optic foramen to the orbital margins, and all the soft parts attached to the lids, the eye-brows and a portion of the cheeks were taken away for examination. The pieces were fixed in Erlick's fluid, colored in toto with carmin embedded in paraffin, were cut in series—some longitudinally, others transversely. It is well known that only in such a way can we find out the real entity of the anomaly, while observations without a careful microscopical examination, or made in times when the technic was imperfect, considered anophthalmos what a thorough microscopical examination, or made with technic were really cases of microphthalmos. Just to this circumstance is due the curious fact of the many reports in the past of cases of anophthalmos and few of microphthalmos and just the contrary in our own days. In the present case an accurate examination of the sections led us to conclude that there was total absence of the eye-globes. Von Hippel[1] in Graefe and Saemisch's Handbuch says he has found in the literature of the subject 87 cases of anophthalmos; but he includes in the list the extreme cases of microphthalmos. Similarly he writes in another contemporary work which appeared in the Graefe's Archiv[2] where he describes a case which he calls anophthalmic, although he found a small nodule of the size of a pea, evidently the rudiment of the eye-bulb. The most interesting case of true anophthalmos seen till now belongs to Hess[3], who found in a chick embryo absolutely no eye-globes and on one side absence of adnexa bulbi. Stroesse[4] found no traces whatever of bulbs in an embryo, and Fischel[5] in a human embryo. The same absence seems to have been observed in a case by Ormond[6], in one described many years ago by Gradenico, and in another by Michel[7]. On the other hand, in the cases reported by Sgrosso,[8] Albrecht,[9] de Bury,[10] Van Duyse,[11] and Hanke,[12] there was a rudiment of ocular bulb, but only of mesodermal nature, and therefore without any trace of optic vescicle, while in all the other cases in the rudimental bulb found there were seen parts more or less developed of ectodermic nature. There was a trace of bulb also in the classical case of Manz[1].

The explanation of these cases has been always an object of discussion. At first these anomalies were considered as the result of an absence of development. Then Manz's hypothesis that it was not an absence but an arrest of development due to local pathological conditions, prevailed for a long time. This hypothesis was confirmed by numerous observations and by convincing argumentations for instance, among the others, processes of bulbar phthisis, infectious and mechanical causes. At present such a belief has been shaken especially after having observed cases of true anophthalmos. In fact, what influence could an inflammatory process have had in absolutely preventing the development of the visual organs, as in Hess's case? How could a pathological process have prevented the complete development of the optic vesicle, optic nerves, chiasma and optic tracts? On the other hand, how could a pathological process have destroyed or arrested the development of the optic vesicle without leaving traces on the parts of the orbital cavity? It has been hinted that the optic vesicle having been destroyed in one way or another the optic nerves, the chiasma, the optic tracts and the optic centres disappear later as a consequence; but this is an hypothesis which finds no support in the congenital anomalies of development. In our case there was no trace of inflammation in the orbital tissues, nor in any other part of the skull, of the meninges and base of the brain, which in the adult and embryo is in relation with the eye and its derivatives, and besides there was absence of optic nerves, optic tracts, external geniculate bodies and anterior corpora quadrigemina. The anomaly must have been developed in the first stage of the embryonic formation (tenth day of life) that is when the brain shows the lateral ectasies, which will constitute the ocular infundibula. These ectasies of the neural canal having not appeared the parts which are derived from them (secondary optic vescicle, optic nerve, optic tracts, etc.), did not develop, while the occipital convolutions and ocular adnexa (muscles, aponeurosis, lacrimal gland, etc.), were not arrested, being absolutely independent of the same. In these cases of anophthalmos we observe that the palpebral opening is always present, while this is considered to be the consequence of the pushing of the eye-globe under way of development. In regard to this latter fact I shall say that the common opinion held in regard to the formation of the palpebral fissure is: 1st, the bulbar protrusion; 2nd, the stretching produced by the levator palpebrarum. Is this true? Although it appears to be logical, no demonstration has yet been made. A small series of experiments made by me shows that the two factors already mentioned contribute only in part. I have used young cats, as these open their eyes very tardily, and I have found that having destroyed the bulb through a small palpebral wound, the fissure appeared just the same, although smaller than normal. The same was the result after cutting of the levator palpebrae.

The mechanism of the palpebral opening is the result of a histological process on the ciliary margin (destruction of the epithelial covering through hyalin degeneration) independent of the aforesaid mechanical causes. These latter may have only an influence on the size, which is smaller when they do not enter as factors. In fact they appeared smaller in our case, as had been found in several of other previous ones.

Bibliography.

[1]Hippel, in Graefe u. Saemisch's Handb. (II. Aufl. 18-19, Lief. page 83.)

[2]Graefe's Archiv., XVLII., 1, p. 288, 1899.

[3]Graefe's Archiv., XXXVIII., 3, p. 104, 1892.

[4]Berliner tierarztl. Wochenschr. N. 50, 1891.

[5]Zeitschrift f. Heilk. XXIV, 1, 1903.

[6]Kl. Monatsbl. Iuli, 1903, p. 63.

[7]Graefe's Archiv. XXIV, 2, p. 71.

[8]Lavoridella R. Oculistica di Napoli., Vol. III, 1896.

[9]Wochenschrift f. Augenheilkunde, 1895, p. 321.

[10]Virchow's Archiv., CVIII, p. 355.

[11]Archiv. d'Opht., XIX., 1899.

[12]Graefe's Archiv., LVII., 1, p. 28, 1893.

ABSTRACTS FROM ANGLO-AMERICAN OPHTHALMIC LITERATURE.

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Serum Treatment of Exophthalmic Goiter.

The clinical tests of the serum prepared by BEEBE as described in his article, and as made by J. Rogers, New York, are reported in *The Journal, A. M. A.,* February 17. In ten cases there were three apparently perfect cures, three other patients were rescued from a critical condition, while the others were more or less improved. The best results with the smallest dose were obtained from the serum first prepared with the fresh precipitates of nucleoproteids and thyreoglobulin, those obtained from the later dried precipitates being less effective. He suggests that the serum contains two active agents, one a cytotoxin having a late and cumulative effect in suppressing the action of the thyroid secreting cells and the other an antitoxin nullifying the action of the excessive thyreoglobulin. The clinical facts justify the supposition that the fresh serum may stop the active poisoning, and a little later inhibit the activity of the gland, and thus, in some way, break a vicious circle and lead to the resumption of the normal functions. He remarks on the difficulties of the preparation of the serum and its possible dangers. He does not believe that every patient can be thus treated as the individual reactions vary. Certain patients without exophathalmos, but with cystic or adenomatous thyroid, complaining chiefly of digestive disturbances and pain together with dyspnea, weakness, soft, feeble pulse, constant or intermittent tachycardia and general nervousness, seem particularly refractory. In bad chronic cases, the patients, of course, can not be expected to recover as quickly as in those that are milder and of less duration. Any mistake in making up the serum may render it useless or dangerous. A very skillful chemist used to biologic work is essential. In conclusion Rogers remarks: "If for a cure of exophthalmic goiter it becomes necessary for some poor sufferer from the disease to die or to be operated on to obtain the pathologic thyroids of exophthalmic goiter in order that others may be saved, it would, indeed, be a scientifically grim romance."

An Antiserum for Exophthalmic Goiter.

BEEBE, S. P., New York (*Journal A. M. A.*, February 17), reviews the previous experimental studies of thyroid cytolysins, showing that they furnish an unsatisfactory basis for clinical application, and then gives his own results. He remarks that in nearly all cases the serums prepared have been taken from animals of a different species from those on which the experiments were made, and lack morphologic specificity. His own serums were developed by using the neucleoproteids instead of the whole organ ground into pulp and his success with hepatotoxin and nephrotoxin thus produced led him to attempt to prepare a serum which would have a cytolytic action on the human thyroid gland and thus be of therapeutic value in inhibiting its hyperactivity in exophthalmic goiter. His first experiments were with two thyroids from fatal cases of the disease, and he isolated in pure form the nucleoproteids and thyreoglobulin and a mixture of the two was injected into rabbits intraperitoneally at intervals of five days; the rabbits were bled on the eighth day after the injection. The serum obtained produced effects which, he thinks are more than mere coincidence, and while he does not think we have yet sufficient data to enable us to give a positive intelligent opinion on some points, and does not claim that the serum is specific, he holds that we have a certain amount of clinical evidence backed up by experimental facts and analogies to be worthy of consideration. Some more clinical experimentation will have to be made, cautiously on account of the possible dangers of the method. He says that at present there is just sufficient light to intensify the darkness.

Surgical Treatment of Goiter.

Hardon, R. W., Chicago, (*Journal A. M. A.*, February 17), advocates the surgical treatment of goiter and reports three cases in which partial thyroidectomy was performed for Graves' disease with good results. His conclusions are, in substance, as follows: 1. Every irregular tumor of the thyroid, no matter how small, should be removed, since in this way only can we save the lives of those having malignant growths. 2. Every regular tumor of the thyroid causing symptoms other than mere deformity, should be resected when after a few months' medical treatment the growth is not checked and no improvement is produced. .3. Avoidance of needless traumatism, care of the stump, free drainage and salt solution to keep the blood and lymph vessels full and to prevent absorption from the wound are points especially mentioned in connection with the operation.

Euphthalmin Conjunctivitis.

Kipp, C. J., (*Ophthalmology*, January, 1906), prescribed a four per cent. solution of euphthalmin hydrochlorid twice a day for an old man with central corneal opacities whose vision was greatly improved by moderate dilation of the pupil. There were no unpleasant symptoms for four weeks when occurred swelling of the lids, pain in the eyes, and muco-purulent secretion. On stopping the drug for a week the conjunctival trouble greatly improved, but at once got worse on resuming its use in two per cent. solution. Kipp found both lids edematous and covered with dried crusts, much dried secretion entangled in the cilia and a swollen conjunctiva covered with enlarged follicles. Investigation at the dispensing pharmacy proved that the solution was really euphthalmin (and not atropin, as Kipp suspected). Bacteriological examination negative. Prompt recovery occurred under a zinc sulphate collyrium and zinc oxid ointment.

Inflammatory Affection of the Ciliary Ganglion, Associated With Retrobulbar Neuritis.

Hay, Percival J., (*Ophthalmoscope*, November, 1905), after drawing attention to the scarcity of literature upon this affection, cites a case, male, 38 years of age, who complained of neuralgic pain back of the right eye, with failing vision. The symptoms were present six weeks previous to examination. A specific history was elicited. Some months previous to examination the patient had suffered from rheumatism, otherwise his general health was good. O. D. V. = 6/60 minus, O. S. V. = 6/6. O. D. pupil was widely dilated and irresponsive, consensual reflex was also almost imperceptible. The cornea was insensitive in some parts and nearly so in others. O. S. showed no changes. The fundi were normal, there being no papillitis or neuritis. The field in O. D. was markedly contracted, a portion being retained on the temporal side. Proptosis, diplopia or abnormal muscular movements were absent. Knee jerks normal. Treatment consisted of potassium iodid grs. x, t. i. d. One week later the pupil had regained its normal size and reactions and the cornea had lost its insensibility. The field showed no contraction and vision had improved to 6/12. Fundi were still negative. Potassium iodid was now increased to grs. xv, t. i. d., with an improvement in vision to normal a fortnight later. At this time the pupils reacted well, although there was still a slightly favored consensual reflex in the right eye.

In concluding his remarks, Hay states that in regards to the diagnosis three symptoms need to be accounted for; first, the loss of vision; second, impaired sensibility of the cornea; and third, the paralysis of the sphincter pupillae. The loss of vision is attributed to the relaxation of accommodative power caused by impairment of the nerve supply of the oculo-motor, a nuclear lesion being excluded owing to the absence of other palsies, also a lesion in the trunk is out of the question for the same reason. The ciliary nerves near the eyeball are eliminated, as there was no affection of the optic nerve.

The above excluded, he draws conclusions from the field of vision which was wanting in the periphery to the temporal side, the nasal side and centre being entirely absent. Assuming that inflammation extending completely around the nerve was the cause, it involved chiefly the temporal half and penetrated deeply enough to involve the macular fibres, which he states, would most certainly have been accompanied by arteritis and thrombosis of the central artery, if the lesion was in that part of the nerve containing the latter. No thrombosis being present, the lesion must have been behind the point of entrance of the central artery, namely the part of the optic nerve opposite the ciliary ganglion. The ganglion being on the outer side of the nerve, any inflammation of its structure would account for the paralysis of the sphincter pupillae, since motor impulses pass through it; and also for loss of sensibility in the cornea, as sensory impulses pass through the ganglion to the fifth nucleus. Not all sensation was lost, since the two long ciliary nerves to the nasal nerve formed an additional path for sensory impulses. An inflammation spreading from the ganglion would account for the appearance of the field of vision. He has assumed the cause to be an inflammation owing to its rapid disappearance. In conclusion, he states that the diagnosis is, of course, a tentative one.

F. C. P.

The Relation of the Facts of Color Blindness to the Psychophysical Theory.

EDRIDGE-GREEN, F. W., F. R. C. S., (*Ophthalmoscope*, November, 1905), states that color vision can only be explained on the assumption that each optic nerve fibre conveys impulses corresponding to all waves of light. He assumes that light falling upon the eye, liberates the visual purple from the rods, forming a photograph. The decomposition of this visual purple chemically stimulates the ends of the cones, setting up an impulse through the optic nerve to the brain. Upon observations on monkeys kept in a dark room, he found the purple between, but not in, the cones. He lays down the hypothesis that the visual purple is the visual substance. He assumes "that the visual centre transmits to the mind impressions of white light, and that objects are seen monochromatically, as in a photograph." This theory is then applied to color blindness. His division of color blindness is into two classes, each of which is separate though both may appear in the same person. In the first there is loss of light and color, in the second, loss for color only. He classifies the color blind according to the number of colors they see in the spectrum, into pentachromic, tetrachromic, trichromic, dichromic and monochromic, the normal being designated hexachromic. He believes shortening of the spectrum to be due to a defect in the visual purple and not to a shortening of the hypothetical red fibres, giving good reasons for his belief. The presence of a neutral band in the dichromic class, is explained by a gradual evolution of the color vision centre until the red and violet encroached upon the gray, meeting in the centre of the spectrum. The next color, green, is evolved at the centre of the spectrum, trichromic vision now being present. Yellow appears next followed in succession by blue and orange. He concludes by stating that there are some very rare cases who see seven colors, although he himself, has not been able to locate one.

F. C. P.

A Note Upon Alypin, a New Local Anesthetic.

STEPHENSON, SYDNEY, London, Eng. (*Ophthalmoscope*, November, 1905), after mentioning the properties of cocain, gives his opinion on the new glycerin derivative, alypin. He states that it is not precipitated by the alkalin fluids of the human organism, and boiling does not affect its properties. He made several hundred trials upon patients of different ages, with the following results:

Smarting occurs, but is not so marked as in cocain anesthesia. Blepharospasm is also less pronounced. Anesthesia is produced in about seventy seconds, vaso-dilation occurring in ninety per cent. The pupil remained normal and the near point was unaffected. No disturbance of the corneal epithelium occurred. Tension was not influenced and the "aspect haggard" of cocain was not seen. He summarizes by stating that alypin is an efficient local anesthetic, wholly devoid of any other action than vaso-dilation. Two per cent. solutions were employed in his experiments.

F. C. P.

Alypin: The New Local Anesthetic.

JACQUES, ROBERT, F. R. C. S. (*Ophthalmoscope,* November, 1905), observes in his trials of alypin, that the vaso-dilation is produced with rather more smarting than occurs in cocain anesthesia.

He uses a two per cent. solution and considers the anesthesia satisfactory.

F. C. P.

Argyrol in Ophthalmic Practice.

HINSHELWOOD, JAMES, M. A., M. D., (*Ophthalmoscope,* January 1st, 1906), gives his experience in the use of argyrol stating that, after quite extensive trials, he concedes this product to be the best silver salt for eye use. He thinks it has as great bactericidal power as any other silver preparation, and in strong solutions is not irritating. Protargol has been discarded from his therapeutic armamentarium. The solutions of argyrol he prefers are the 20 and 30 per cent., attributing many failures to the use of too weak solutions, or infrequency and means of application. He has observed that while fresh solutions of the drug are unirritating, this property to a certain extent, diminishes upon exposure to light for a time. Consequently he always orders argyrol in light-proof containers. The drug is employed by Hinshelwood in the following conditions: Conjunctival diseases, ulcers of the cornea, blepharitis, ophthalmia neonatorum, and lacrimal cases. In mild conjunctivitis he instills a few drops of a 10 per cent. solution into the conjunctival sac three or four times a day. In granular cases a 20 per cent. solution is employed similarly and a 30 per cent. solution is painted on the conjunctiva of the everted lids. After subsidence of the discharge in these latter cases, recourse is had to the copper pencil in addition to argyrol instillations. In ophthalmia neonatorum he considers argyrol "of the greatest service," as it can be employed freely and its use entrusted to the patient's attendants. He has long since ceased to employ silver nitrate in this condition. Stress is laid upon the frequency and strength of the solutions. Every hour after thorough cleansing, he instills a 20 per cent. solution, and if the case be very severe, a 30 per cent. solution is painted on the conjunctiva of the everted lids. Involvement of the cornea calls for more frequent instillations. For use in cases of corneal ulcer a 5 and 10 per cent. solution is used, or the following ointment:

℞

Argyol	gr. vi. to xii.
Holocain	gr. i.
Atropinae Sulph	gr. ½
Vas. alb	ʒii.

M. et Sig. Introduce into conjunctival sac t. i. d.

The virtues of this ointment are in its powerful bactericidal effect together with the analgesic and sedative properties. The treatment of blepharitis is accomplished by freeing the lid margins from all crusts and scrubbing in a 30% solution by means of a shortly-trimmed camel's hair brush. Excellent results are claimed for this method. In lacrimal disease a solution of argyrol, 10, 15 or 20%, is used to wash out the sac, a few minims being injected. If more than a few minims are injected the operator takes the risk of causing an extravasation into the tissues thereby causing a permanent stain. As far as staining of the conjunctiva is concerned, Hinshelwood has seen it produced to a slight extent in a few cases after six to twelve months' use of the drug. He concludes by stating that argyrol is a most useful addition to the therapeutic agents at the command of the ophthalmic surgeon. F. C. P.

The Localization of Foreign Bodies in the Eye.

SWEET, WILLIAM M., M. D., (*Ophthalmoscope*, Jan. 1st, 1906), in his opening remarks, states that an incised or punctured wound of the eyeball cannot be accepted as positive proof of the existence of a foreign body within the globe. With the media clouded, the diagnosis of iron or steel within the eye may be accomplished by means of the sideroscope, the electro-magnet, or the Roentgen ray. He considers the sideroscope unreliable owing to its susceptibility to external influences. Also the magnet can not be used for diagnostic purposes on metal other than iron or steel. He states that serious results have followed the use of the large Haab magnet. The Roentgen ray is then, in his opinion, the only reliable means of obtaining a positive diagnosis. He states that in one hundred cases of negative examination with the Roentgen ray, the eye in which enucleation was performed showed no foreign body. He believes that any particle large enough to penetrate the ball will necessarily have to cast a shadow upon the photographic plate. Sweet then goes on to describe his localization apparatus, the principle of which is based upon the triangulation of the planes of the shadows secured in two exposures and their relationship to the shadows cast by two metal balls. The apparatus is described in detail as well as its method of use. In concluding he states that accuracy of localization has been fully proven in cases where the magnet failed and enucleation was performed. F. C. P.

Unusual Fundus Conditions.

DUANE, A., New York, (*The Ophthalmoscope,* December, 1905), records the clinical histories of five cases showing very unusual fundus conditions worthy of reference. Two of these showed the presence of a sharply-defined circular black spot in the macular region associated with myopia, such as has been described by Fuchs and other observers. In the first case there was progressive myopia, with the development of the black spot and sudden reduction in vision, while in the second case, there was myopia with an extra macular black spot and comparatively good central vision. The third case was one of coloboma of the chorioid and retina skirting the macula with paracentral scotoma. The fourth case was one of coloboma of the chorioid in the macular region with partial retention of the retina. The last case of the series showed coloboma of the chorioid with a filament projecting from it into the vitreous.

S. H. B.

The Giant Magnet.

WHARTON, JOHN, (*The Ophthalmic Review,* December, 1905), gives an account of his conclusions drawn from the use of the giant magnet at the Manchester Royal Eye Hospital. In his description of the apparatus he states that the magnet consists of a core of annealed soft iron which is encircled by two coils. The coils are wound to carry a current, obtained from the main, of six amperes, but by means of a resistance situated at the side of the stand, the strength of this current can be reduced from six to three amperes, and consequently the pull of the magnet can be varied at will. With a current of six amperes passing through the coils, the magnet can exert a pull of 30 pounds per square inch sectional area, when the object which is being attracted is at a distance of one inch from the point.

The account is considered under several headings, the first of which is: "The time intervening between the accident and the operation for removal." He is very much in favor of the early use of the magnet, and states that when the piece of metal has been in the eye under forty-eight hours he has never failed, by careful manipulation of the patient's head and by the use of a gradually increased current, to effect its removal; whereas, in one case, with a four weeks' history, the magnet had no effect, although the metal was situated well forward in the globe.

The situation of the point of entry he considers to be of great importance. In corneal wounds the ultimate results depend upon whether the final position of the metal is in the lens or beyond in the vitreous or ocular tunics. In the cases observed by Wharton, where the metallic particle was situated in the lens, the results, without exception, were excellent, no eye having been lost, and the ultimate vision, after extraction of the cataract, good. In the other class of cases, in which the metallic particle passed through and beyond the lens, the results were disastrous, enucleation having been required in all the cases. In wounds of the ciliary body or further back in the sclera, his results were extremely good. He has never had to enucleate eyes wounded by pieces of metal penetrating the ciliary zone, although in all such cases the metal has rested at the back of the vitreous chamber. In referring to the influence of the size and shape of the piece of metal, he says the pieces may be considered as spicules, scales or "chunks." The spicules are easiest to withdraw, due, probably, to the fact that the poles are more apart.

In speaking of the septicity of such wounds, Wharton states that all chips of metal entering an eye may be considered as free from organisms, and the septic inflammation which follow injuries produced by such metal are produced by the subsequent entry of organisms, either by the migration along the track of the wound, or by admission at the time of operation for the removal of the foreign body. The superiority of the great magnet is here shown, since immediate contact with the eye is not necessary—in fact, is injurious—and by using a pulling force graduated by the strength of the current and the distance of the patient's eye from the point of the magnet, there is the minimal amount of tissue disorganization, and the risk of infection from actual contact is nil. In concluding this valuable contribution, Wharton ventures to suggest that: 1. In recent cases with an open wound, remove the metal through the wound. 2. When the original wound has completely healed, endeavor to draw the foreign body into the anterior chamber through the circumlental space, whence it may be easily removed. 3. Should the preceding fail, make a large corneal flap, when it will probably be found easy to remove the metal.

S. H. B.

Influence of Frynin on the Eye.

Popow, V., Persia, (*Ophthalmic Review*, January, 1906), contributes a preliminary communication concerning some experiments with frynin, the alcoholic extract from the cutaneous and so-called parotid glands of the toad. He obtained the substance by Kravkow's method, and used a 1 per cent. aqueous solution to which he added the sublimate by Valentine's method.

"At the first instillation of 3 or 4 drops of the above-mentioned solution into the conjunctival sac, there was evidently some irritation, blepharospasm, free lacrimation and photophobia, and the vessels of the conjunctiva were engorged; subsequently there was edema and slow loss of the sensibility of the conjunctiva and cornea. The changes of the epithelium of the cornea from frynin resembled the changes from cocain, although in a much less degree. Diffusion in the anterior chamber, explored by Bellarimow's colored method, increased almost doubly. There was a little miosis, but refraction, accommodation, acuteness, and the field of vision were almost unchanged. Intraocular tension was examined with Maklakow's tonometer. In the first hour after instillation, tension was not augmented. The solution was invariably boiled before use." This observer also states that under the influence of frynin he has performed two iridectomies for optical purposes, one discission of cataract, some openings of the punctum lacrymale, etc. S. H. B.

Spindle-Shaped Enlargement of the Blind Spot Associated With Congestion of the Optic Disk.

Ramsey, A. Maitland, and Sutherland, A. W. M., (*Ophthalmic Review*, January, 1906), record the histories of several cases in which the blind spot had undergone changes in its configuration in connection with the manifestations of sympathetic irritation. It is recalled that normally, the blind spot of Mariotte is an oblong space with rounded corners lying a little to the right or to the left of the fixation point. The rounding of the angles varies in different individuals, and the vertical length has to the horizontal breadth the proportion of six to four. About one-third of the whole space is above a horizontal line drawn through the fixation point. A narrow zone of relative or transitional amblyopia for white surrounds the area of absolute blindness, and outside this is the limit of the absolute scotoma for blue, then that for yellow, then that for red, and last of all that for green, the order being the same as that which obtains at the peripheral part of the visual field, and there seeming to be a zone of transitional amblyopia for all the colors. The absolute blind area for green is relatively very large, and its inner boundary almost reaches the point of central fixation. In the five cases, recorded by the observers, the enlargement was altogether vertical, and there was no change in the horizontal width. The entire group of cases, with but one exception, showed symptoms of sympathetic irritation and more or less congestion of the disk in connection with this spindle-shaped enlargement of the disk. The exception referred to was a case of sympathetic inflammation occurring one week after enucleation of the exciting eye. These observers reach the conclusion from a consideration of these five cases that it seems highly probable that under certain circumstances, the spindle-shaped enlargement of the blind spot may furnish an important and valuable danger signal of the approach of sympathetic inflammation. They further state that it seems highly probable, if not almost certain, that the spindle-like enlargement of the blind spot denotes active congestion of the optic disk, the shape being determined by increased size and turgescence in the superior and inferior branches of the retinal artery and vein. S. H. B.

Corneal Absclssion.

CRAWFORD, J. M., Atlanta, Ga., (*Atlanta Journal-Record of Medicine,* January, 1906), in a recent paper on the subject of corneal abcission, speaks very favorably of this method of operative procedure. He gives the technic employed by Critchett and Knapp, but prefers the latter's method, describing it in detail. Having in mind the prejudice of many of his colleagues and the specific objection (sympathetic ophthalmia) he wrote to a number of the leading ophthalmologists of this country asking them to answer certain questions, which answers he has condensed into tabular form and appended to his paper. He also includes the table previously published by de Schweinetz. These statistics seem to favor the operation. Crawford's individual experience, covering forty-one operations, showed only one case of cyclitis; a very creditable showing. The operation is indicated, according to this observer, in cases of staphyloma of the cornea. Eyes in which suppuration has begun, may be abscised without danger, unless the process has involved the surrounding orbital tissues, or already begun to extend posteriorly so that an aseptic socket would be difficult to obtain. Staphylomatous eyeballs in children, when not inflamed, may be treated by the operation of abscission or keratectomy, although it is possible in after years for the stump to undergo calcareous or osseous change, which may cause sympathetic irritation in the other eye and require enucleation.

As contraindications, he mentions eyes so diseased or injured that they have already excited sympathetic ophthalmitis, eyes containing malignant growths, shrunken eyes, and extreme age or debility of the patient. Under such circumstances he prefers enucleation.

An Improved Thermo-Cautery for Eye Work.

STEPHENSON, SIDNEY, London, (*The Ophthalmoscope,* December, 1905), describes in detail a small size thermo-cautery devised by W. H. Beach, which is especially adapted for ophthalmic work. The cautery is made up of the following parts: The hollow handle, which acts as a combined reservoir and vaporizer, is lined with cotton wick, which is saturated with hydro-carbon (petrol) before using the instrument. The trunk comprises an aerator, a refrigerator, a stop-cock and a collar, kept in place by a spring. The collar carries an index and an air-tube, the latter forming an attachment for a rubber bellows and tube. A heat-resisting block contains a gauze septum and a standard, to which the working points are secured. The points are of platinum, hollow, and perforated near the base by a tiny hole through which the products of combustion are blown directly backwards. In order to work the instrument, the vaporizer is unscrewed and sufficient petrol is poured into the handle to supersaturate the wick lining, and the excess liquid is returned to the bottle. Having screwed the vaporizer firmly to the trunk, the bellows-tube is connected with the nipple. The index, marked by an arrow on the collar, is set directly pointing to the tested spot, indicated by a dot engraved upon the trunk; the working point is then screwed to the connecting standard and plunged into the spirit flame about thirty seconds. As soon as the platinum point has become slightly red, the bellows are squeezed and the point should glow.

S. H. B.

Restoration of Socket for Carrying an Artificial Eye.

DOYNE, ROBERT W., London, (*The Ophthalmoscope,* December, 1905), describes the technic of an operation he performs for the restoration of the socket for carrying an artificial eye, as follows: "A large needle, threaded with stout silk, is passed from the conjunctiva of the lid beneath the skin and made to emerge in the patient's mouth between the cheek and the gum at a point opposite the angle of the mouth. The needle is withdrawn and threaded with the other end of the silk, and again passed through the conjunctiva, about half an inch away from the first puncture, and made to emerge in the mouth at the same point as the first thread. The two ends of the suture are next tied over a piece of match or rubber tubing, lying between the cheek and the gum, and the match or tubing is twisted two or three times a day until the silk cuts out. This generally happens in the course of three weeks or so, leaving a band of cicatricial tissue which, by traction at its base, effectually raises the lower lid. The point of entry of the needle should correspond, one to the inner and the other to the outer, side of line of conjunctiva, that is designed for the new sulcus."

S. H. B.

Disseminated Sympathetic Chorioiditis.

Coppez, Henri, (*The Ophthalmoscope*, December, 1905), gives a review of the literature of this very rare and interesting disease and cites two cases in detail that have come within his personal observation. He states that the affection manifests itself by the appearance of little round spots of yellowish color in the periphery of the chorioid. These are very small, measuring scarcely 1/10 of the papillary diameter; they are of nearly equal dimensions, but at times some become confluent in such a way as to form a focus of some little size with festooned edges. They are to be found more particularly near the branches of the retinal vessels which often cross them. Their border is regular—not encircled by pigment. There is generally little effect on the neighboring parts. The papilla is slightly hyperemic; the veins are more or less dilated. The vitreous body remains transparent. The iris does not present anything special; there is sometimes a little Descemetitis. Parakeratitic injection is absent or very slight. After several months these deposits disappear, leaving behind no traces, or they become atrophic; they bleach, but without abnormal pigmentation; others persist without modification. The prognosis is favorable. The majority of cases known have recovered. Atropin and mercurial injections are recommended, and, above all, a prolonged sojourn in a darkened room.

A Case of Cephalic Tetanus Following a Contusion Wound of the Outer Canthus.

Ramsay, A. Maitland, (*Ophthalmoscope* Nov., 1905), reports an unusual case of tetanus in which the symptoms were localized chiefly in the facial muscles of the right side. Patient, female, aet. 23, was struck with a walking stick four days previous to examination. At the time of admission to the hospital she presented a suppurating wound extending 3/8 of an inch outwards from the external canthus. The bulbar conjunctiva was greatly chemosed, covering half of the cornea which was intact. Ecchymosis of the lids and swelling of the right side of the face were present. The anterior chamber was of natural depth, the pupil was dilated and irresponsive. There was no red reflex and light perception was abolished. Three days later the lower jaw became stiff, especially on the left side. The facial swelling gradually left but stiffness of the muscles increased. One week later trismus was strongly suspected, the patient being able to open her mouth only on the left side. The right side of the face was paralyzed but the degree of orbicular palsy was masked by the swelling. The labio-nasal fold was never completely obliterated. The occipito-frontalis was involved and the wrinkles on the right side of the face were less marked. Knee-jerks were exaggerated and ankle-clonus was present. On the next day stiffness of the right trapezius developed and a consultation elicited a sinus extending to bare bone at the malar process of the superior maxilla.

Bacteriological examination showed large numbers of the tetanus bacillus. Antitetanic serum was employed at once. There was no change until the third day when during cleansing of the sinus, an attack of severe laryngeal spasm occurred, causing fears of death from suffocation. After a few minutes this relaxed, being followed shortly afterwards while drinking by sudden slight spasm of the pharynx, similar to that occurring in hydrophobia.

The serum injections and large doses of chloral were continued with a lessening of tonic contractions on the following day, although there remained a tendency to spasmodic dyspnea whenever the wound was dressed, however, not so severe as on the previous day. From this time on improvement set in and the injections were intermitted for six days. During sleep, relaxation of the muscles occurred but when awake occasional spasmodic contractions took place, causing the tongue to be bitten severely. As the sinus was not discharging freely, an opening was made and a drainage tube was inserted.

About a month later, rapid improvement was being made and at the time of writing (two weeks later) little difference existed between the two sides of the face except in the right occipitofrontalis. At this time there was a slight discharge from the sinus. Electrical reactions of the right side of the face were normal, left side sluggish. O. V. D.=hand movements at six feet; fingers at two feet. Perimetry was unsatisfactory. Ophthalmoscope shows rupture of chorioid down and in, near the macula. Remainder of fundus is normal.

Ramsay concludes by calling attention to the recovery of this case and attributes the outcome to the use of anti-tetanic serum of which a total amount of 150 cc. was given in six doses. Distinct benefit followed each injection after the third. Large doses of chloral were given, 3,000 grains in all, 150 grains per day for the first sixteen days. The patient's general condition was kept at top notch. During the attack the pulse averaged 90. F. C. P.

Infantile Cerebral Diplegia With Blindness.

KAUFFMAN, O. J., Birmingham, (*The Ophthalmoscope*, Sept., 1905), reports a very interesting case of infantile cerebral diplegia with blindness occurring in a female child, which he regards as being syphilitic in origin. He is governed in this diagnosis by the presence of a chorio-retinitis which he thinks must have existed coincident with the optic atrophy which induced the blindness. This feature he believes to be strongly in favor of congenital syphilis. Apart from this, the history has little bearing on ophthalmology. S. H. B.

The Early Symptoms of Insular Sclerosis.

HOBHOUSE, EDMUND, (*The Ophthalmoscope*, Sept., 1905), in an original article with the above heading states that many of the early symptoms of this disease are overlaid with the phenomena of hysteria. Prominent among the ocular manifestations are transient ocular paralysis, temporary amaurosis, true nystagmus and pallor of the disk. He advocates a series of careful observations of the state of the disks in all cases of sudden failure of vision owing to the possibility of this being a premonitory symptom of insular sclerosis. Temporary failure of vision in persons between the ages of 20 and 40 years, he thinks should be regarded with suspicion. This paper appearing in an ophthalmological journal would lead the reader to suppose that it was rich in ophthalmological hints, but unfortunately this expectation is not realized. S. H. B.

The Significance of the Eye-Symptoms in Disseminated Sclerosis of the Brain and Spinal Cord.

UHTHOFF, W., Breslau, (*The Ophthalmoscope*, Sept., 1905) in a recent communication gives a summary of his observations of the eye-symptoms in disseminated insular sclerosis of the brain and spinal cord made on 150 cases. The consideration of the subject from this standpoint rather than bibliography affords a dissertation of great value to the clinician. The author remarks at the onset, the importance of the changes in the nervous optic conducting apparatus as diagnostic factors in this disease. These changes are most marked in the optic nerve and consist largely in simple atrophic alterations in the color of the papilla. These he divides into three groups: 1. Atrophic discoloration of the whole papilla; 2, An incomplete atrophic pallor of the whole papilla, so that the inner parts of the papilla still retain a slight reddish tint; 3, A partial limited atrophic discoloration of the temporal part of the papilla.

Cases of the first group (i. e., total atrophic discoloration of the papilla) he states, are comparatively rare, constituting 3 to 4 per cent. of the total number of cases; the second and third groups always constitute about 20 per cent. of all cases. In 5 per cent. of all cases, he noted optic neuritis. The changes in the papilla in multiple sclerosis he considers to be of an inflammatory nature. To the above figures must be added about 5 per cent. of the cases of disseminated sclerosis in which visual disturbances occur but no pathologic ophthalmoscopic changes are visible. Consequently, he argues, the optic nerves or more particularly the optic conducting apparatus, in at least 50 per cent. of the cases are affected sympathetically.

The clinical manifestations of the visual disorder may be manifold, thus corresponding exactly with the other symptoms of the disease. The amblyopia of disseminated sclerosis, resembles mostly the visual disturbances which we observe in so-called retrobulbar neuritis.

Uhthoff groups the alterations he observed in the visual field as follows: 1, Central scotomata with a free peripheral visual field. The scotomata are more frequent on both sides than on one only, and are more often relative than absolute; 2, Central scotoma with a simultaneous peripheral contraction of the field of vision; 3, Peripheral, irregular contractions of the visual field; 4, Regular concentric functional contractions of the field of vision. This may be encountered in simple cases as well as in those complicated with hysteria; 5, Ring scotoma, rare; 6, In isolated cases, in onset a certain anomaly is present, which, however, clears up (e. g., a central scotoma), and then another place is seized and here the abnormality persists, e. g., a peripheral contraction.

Anomalies with decided hemiopic character seem to occur very seldom, although in his experience the chiasm and optic tract are comparatively often the seat of sclerotic changes. In every case, he states, the anomalies of the field of vision correspond throughout to the picture of the perpheral affections of the optic nerve trunk.

Uhthoff also shows that in almost one-half of the cases, the visual disturbance sets in quickly, and often suddenly; later improvement of the appearances, which occurs in about 50 per cent., is also a sign that it is often not a matter of simple degeneration phenomena of the optic nerve fibers. In the second half of the cases, the visual disturbance appears slowly and more gradually. In both cases, affection may be present on one or both sides. Permanent bilateral complete blindness must be looked upon as extremely rare in disseminated sclerosis. Transitory, complete, or almost complete blindness occurs at times and is frequently one-sided in which cases it is sometimes traceable to a neuritis. Recurrence of the visual disturbance in multiple sclerosis is not rare. The disturbance of color-vision is relatively quite insignificant. The affections of the eye-muscles in disseminated sclerosis include paralyses and nystagmus. Paralysis occurs in about 20 per cent. and nystagmus in 12 per cent. of cases. Nystagmus-like twitchings are more frequent. Miosis with slight pupillary reaction he observed in 5 per cent. and inequality of the pupils in 4 per cent. of cases.

S. H. B.

Retro-Ocular Neuritis.

GUNN, R. MARCUS, (*Ophthalmic Review*, October, 1905) in discussing this subject states that the diagnosis may, for a time, rest solely on the subjective symptoms; within a varying period, however, ophthalmoscopic changes such as neuritis involving the papilla, or pallor of the disk, are to be observed. The chief symptoms are rapid failure of vision, often monocular involving the macular area, orbital pain and tenderness, impaired pupil-reaction to light, absence of decided early ophthalmoscopic changes, and a tendency to recovery. These are essential to a differential diagnosis between retro-ocular neuritis involving the papilla and a pure papillitis arising independently of intra-cranial or other diseases. Affections of the macula may be distinguished from this condition by the absence of associated pain, the occasional presence of metamorphosia, sometimes a positive scotoma, and sometimes a history of recent exposure to excessive light. We frequently find edema and small, round, pale yellow spots in the macular region in such a case, but the optic disk usually remains unchanged. Further, Gunn says, in the early stages, so long as our diagnosis rests merely on subjective symptoms, retro-ocular neuritis is liable to be simulated by functional amblyopia, necessitating extra vigilance since the same type of individual is often liable to both forms of visual affection. A careful examination of the behavior of the pupil to light should always serve in distinguishing between them; the reaction is invariably impaired when there is even moderate amblyopia from neuritis, while it remains normal in cases of functional origin. In this article, Gunn analyses each of the several symptoms discussing them at great length. The etiology and pathology are also taken up. For purposes of description he classifies all cases of this affection into two great groups: 1. Those due to inflammation communicated to the nerve from neighboring structures; 2. Those due to inflammations or other rapid changes occurring initially in the optic nerve. The article is well-written and contains considerable valuable information. S. H. B.

A Family with Irideremia.

HAMILTON T. K., Adelaide, South Australia, (*The Ophthalmoscope*, October, 1905) reports the occurrence of irideremia in five members of one family. In considering this group, he remarks the various conditions that are associated with the absence of the iris. Among these he found marginal changes of the cornea, probably the so-called fetal ring; microphthalmia; high-arched palate and non-symmetrical jaw; defective permanent teeth; lenticular opacities, and dislocation of the lens. This series of cases is mentioned to illustrate the fact that heredity is a factor of importance in the etiology of irideremia. As regards treatment, Hamilton advises the wearing of amber-tinted glasses as suggested by Seabrook. S. H. B.

Paralytic Strabismus from Fracture of the Sphenoid Bone.

Wainwright, J. M. and Murray, G. D., of Scranton, Pa., (*The Ophthalmoscope* October, 1905), report a very interesting case of head injury in which strabismus developed as the result of fracture of the sphenoid. The patient, a man 33 years of age, was injured by having his head caught between the buffers of two cars. He was dazed at first, then became conscious and after an interval of several hours developed alternating stupor and delirium. The upper part of the right pinna was torn from its attachment, and over the zygoma there was a punctured wound through which no bone could be felt, and there were no external signs of fracture on this side. There was considerable clotted blood in and around the right auditory meatus, and a watery discharge coming apparently from the meatus. Above and behind the left ear there was considerable hematoma, with blood-clot crepitus and, though the deceptiveness of the edge of the blood-clot was kept in mind it was considered that the edge of a depressed fracture could be felt at this point. There was no muscular paralysis. Pupils were mid-wide and equal. No ocular paralysis was to be detected in the unconscious patient. Immediate operation was performed to elevate the supposed depressed fracture, but no fracture was found and accordingly the wounds were sewed up. On the seventh day after the operation, it was first noticed that there was an internal strabismus which gradually increased in degree. The patient was troubled with double vision. This disappeared after a time although the strabismus remained marked. Hearing was much impaired. Paralysis of the external recti remained permanent and hearing in the right ear continued to be very much reduced. S. H. B.

Orbital Sarcoma: With Report of a Case and a Discussion of Radical Operation, X-Ray Therapy, and Electro-Chemical Sterilization.

Ring, G. Oram, Philadelphia (*N. Y. Medical Journal and Philadelphia Medical Journal,* June 10, 1905) arrives at the following conclusions:

1. The difficulty in accurate diagnosis under certain conditions entirely justifies an exploratory excision with removal of a section of growth for microscopic study, said exploration likewise serving to determine the ramification of the tumor.

2. The brilliant results achieved by a number of accurate observers in the field of Roentgen ray therapy justify the immediate tentative application of the method before any radical operation is attempted. If unsuccessful in removal of the growth, the virulence of the latter will probably be decreased and the dangers of metastasis lessened. (Leonard).

3. If the sarcoma is encapsulated, operative intervention without orbital evisceration promises a successful outcome.

4. In view of the almost constant recurrence after orbital evisceration, the removal of the growth itself is regarded as sufficient unless the periosteum or bony wall is involved.

5. The encouraging results reported from the cataphoric sterilization of malignant growths in others parts of the body seem to warrant the utilization of this method in the orbit, due care being exercised as to strength of current used. (Massey.)

6. Future experience must determine whether better results will be achieved by using this method for the original growth, or reserving it for recurrence *in loco*.

7. If operation has been performed and the growth has recurred, we have at command these two valuable methods of attack. M. L. F.

The Value of Recognition of Errors of Refraction in Functional Diseases of the Nervous System.

FISHER, EDWARD D., New York, (*New York Medical Journal and Philadelphia Medical Journal* July 22, 1905) says that epilepsy is one of the most frequent as well as one of the most difficult diseases which a physician has to treat and that while it has been his custom to remove any abnormal condition of the eyes, the same as any other abnormal condition, he has never found that it had any special influence in effecting a cure. In acute chorea no operation can be looked upon as the cause of its cure because the disease is self-limited. Chronic chorea he has never seen affected by correction of the errors of refraction. Negative results were obtained by a rather exhaustive investigation of this subject, as regards epilepsy and chorea, by the New York Neurological Society a few years ago. Fisher has never observed in cases of melancholia which have recovered any direct relation to treatment for any special disease of any organ, and cannot conceive of eyestrain as influential. Cases have been recorded of cure of general paresis by correction of errors of refraction, and he urges that it is important to emphasize the futility of such claims as they tend to interfere with the proper treatment of one of the most serious mental diseases. M. L. F.

Eye Infection. Second Hundred Cases With Bacteriological Examination.

SMITH, DORLAND, (*Archives of Ophthalmology*, Sept., 1905) found 65 cases of conjunctival infection, 10 of corneal infection, 10 of lacrimal infection and 15 of infection of other nature. Of the 65 cases of conjunctival infection 14 were caused by the staphylococcus, 12 by the pneumococcus, 6 by the gonococcus, 6 by the diplobacillus, while in the remaining 27 no one organism was especially prominent. Of the 10 corneal cases the streptococcus occurred in 4, the staphyloccoccus in 2. Of the 10 lacrimal cases pneumococci and streptococci were present in 7. No organisms of any kind were found in 10 cases.

M. L. F.

Case of Multiple Cyst-Formation of Both Lower Fornix Folds.

ACKERMANN, (*Archives of Ophthalmology* Sept., 1905) reports the following case. In each lower fornix of a man 56 years of age were ten cysts of various sizes. The largest were 3 mm. in diameter, the smallest about the size of a pin's head. Sections of the fresh material showed that the cyst sac was composed of firm fibrillary connective tissue lined with flat epithelial cells. The contents were a colorless fluid of normal reaction, containing numerous desquamated and partially fatty cells with a few leucocytes and amorphous detritus in which the hydrochloric acid test showed granules of carbonate of calcium. A portion of the conjunctiva containing the cysts was excised and examined. The conjunctival epithelium was irregular and thinned except here and there where it was thickened. At these points there was an extraordinary development of beaker cells, which appeared as large cylindrical and cubical cells filled with a transparent granular mass faintly stained by eosin. The nuclei were long and lay close to the cell wall. There was a decided proliferation of round cells in the subepithelial tissue. The layer below this, composed of rather thick fibrillary connective tissue, also showed an increase of nuclei with many capillaries and dilated lymph vessels. In this layer lay the cysts, which projected at some points into the layer above and almost to the surface. Around the cysts were several collections of lymph cells. Near the cyst walls the rather irregular connective tissue fibrils assumed a somewhat parallel course. No sharp boundary was present but two layers could be distinguished, one peripheric with wide meshed, coarser fibres poor in nuclei, the other central with fibres closely arranged, fine and provided with numerous fusiform nuclei. The true stratum proprium was lacking. Cross-section of the largest cysts showed a double layer, a parietal layer of flat cells with long nuclei which stained deeply with haemalum, and a layer of almost cuboidal cells with oval nuclei more faintly stained. Some cells among the latter had undergone mucoid degeneration. The epithelium showed great variability. From the surface of the conjunctival epithelium numerous epithelial tubes dipped into the tissue beneath. These were characterized by their epithelium, which corresponded to that of the conjunctiva, by the beaker cells, and by the absence of a membrana propria, as analogous to the class of simple epithelial inclusions described by Iwanoff. No remains of glands, acini, or excretory ducts could be found. M. L. F.

Astigmatism, a Cause of Vomiting in School Children.

BRAY, AARON, Philadelphia, (*New York Medical Journal and Philadelphia Medical Journal*, Aug. 26, 1905) reports four possible cases of reflex vomiting dependent on errors of refraction. M. L. F.

Epilepsy and Eyestrain.

SPRATLING, WILLIAM P., (*New York Medical Journal and Philadelphia Medical Journal* Sept. 16, 1905) adds a brief clinical note to his paper published in *American Medicine*, April 9, 1904, entitled "The Nonoperative Relief of Eyestrain for the Possible Cure of Epilepsy as Tested in 68 Cases at the Craig Colony." As a result of this test, which was very painstakingly made by Dr. Gould and Dr. Bennett, one patient only seemed to show a possibly recovery from the use of glasses. The patient remained under observation and the attacks of epilepsy recurred. The point to which he wishes to call attention is that "the glasses in this case seemed to *repress* the epileptic attacks in a manner not unsimilar to the *repression* that is often secured by the use of the bromids, and that like the bromids, while they may mitigate the disease, they are without power to cure." M. L. F.

A Case of Symmetrical Congenital Absence of the Chorioid and Retina Except in the Macular Area.

LANDMAN, (*Archives of Ophthalmology*, Sept., 1905), reports a case of this nature met with in a man, brunette, 44 years of age. The eyes were normal in their outward appearance. Color sense was nearly normal. Visual fields were contracted to about three degrees. O. D., V 6/18; with —1 D axis 90=6/8. Read Jaeger No. 3, at 10 inches, O. S., V 6/18; no improvement with glasses. Read Jaeger No. 5 at 10 inches. Ophthalmoscopical examination of the right eye showed a brilliant white reflex. The sclera showed everywhere; the perfectly white background was relieved only by the presence of the pale disc with its narrow central vessels, and a vascular plexus in the macular region, perhaps a trifle larger than the disc, with two blood vessels ascending from the plexus. Small thin masses of pigment, about the size of half a pin's head, were scattered through the fundus. No chorioidal vessels were visible. The central artery and vein were minute and undeveloped. In the macular region a group of vessels formed a fluffy plexus over an area a little larger than the disc. From the upper outer portion of this plexus a large, broad vessel passed obliquely upward and outward toward the periphery of the fundus, divided into two streams which united again just before it became lost in a plexus of vessels in the upper outer periphery of the fundus, presumable the vorticose vein. From the inner upper corner of the macular plexus a broad vessel ran upward and inward until it disappeared through the sclera on a line with the vorticose vein just mentioned. Nasally from this vessel was another group of vorticose veins. In the outer lower perihpery of the fundus was another vorticose vein. No cilioretinal vessels could be seen. This description applies to the condition of the left fundus except that here there were only two vorticose groups above and none in the lower part of the fundus, and a difference in the arrangement of the blood vessels coming from the macular plexus. M. L. F.

A Case of Sarcoma of the Eye Involving Chiefly the Ciliary Body.

WOOLLEY, PAUL G., (*Johns Hopkins Hospital Bulletin*, December, 1905.) The case was that of an officer in the Philippine's Constabulary, who was struck in the eye by a bamboo stem on January 13, 1903. A thorn of the stem penetrated the right lower lid near the outer canthus, without injuring the globe. Some inflammation of the lid and conjunctiva followed the injury, but this was transient. March 10, 1903, about two months after the injury, after hard work in the field, the patient noticed some photophobia, but no impairment of vision. By the middle of July there remained only light perception and pain in the injured eye was so severe that sleep was interfered with. On August 29th, the injured eye was totally blind. Enucleation was performed September 23, 1903. The right eye microscopically showed the thickening extending about three-fourths of the circumference of the eye and was localized in the region of the ciliary body and the immediately adjacent portions of the chorioid. The growth was thickest just posterior to the corneo-scleral junction, and just at the insertion of the iris, that is, in the region of the ciliary body. It was whitish in color, and had no macroscopic evidence of pigmentation. In one place there was some staining, as from hemorrhage. The cornea and retina showed no variations from normal. The tumor immediately in the neighborhood of the ciliary body at first sight showed the picture of a small round-cell sarcoma, but another type of cells was also present, cells that were separated by healthy-looking connective tissue into alveoli and columns. Many of these cells were typically epithelioid in appearance, and strongly resembled those of perithelial sarcoma. The individual cells were polyhedral, with abundant protoplasm, which stained well with acid dyes, and had round vescular nuclei. They were probably of perithelial origin.

In sections stained by Mallory's method, the preparation showed a well-marked and complete intercellular recticulum. This reticulum was so arranged that certain of the cells were arranged in complete columns, between the individual cells of which there was a very delicate meshwork. The reticulum between the columns was coarser. But in other places there was a complete lack of orderly arrangement, and in such areas the cells were closely packed together, but each was surrounded by a very delicate reticulum.

Woolley was of the opinion that in this tumor two types of tissue participated, one a pure undifferentiated connective tissue, the other perithelium, i. e. those cells forming the lymph spaces about the blood vessels.

In the literature on tumors of the eye there are comparatively few cases of leucosarcomas originating in the ciliary body. Parsons reports a case of spindle-cell sarcoma in a youth, fourteen years old, and was inaugurated by a blow upon the eye.

In Fano's case the growth appeared in a ten-year-old girl.

Haensell and Fieuzol reported a case in a woman aged 43.

Groenouw's case occurred in a man, 28 years old, following a blow upon the eye.

Kerschbaumer reported a case in a man 27 years old.

Meyerhof observed an unpigmented tumor in a man, 72 years old, and also a circumscribed alveolar endothelial sarcoma of the ciliary body in a man, 50 years old.

As for the etiology of sarcoma of the uveal tract, there is some difference of opinion. In Woolley's case, at least, the growth may be referred to the injury caused by the bamboo thorn. But in the statistics of Treacher Collins, trauma could be established in but 7 cases of 103, of 6.79 per cent.

MORTIMER FRANK.

Disorders From Eyestrain.

GRIFFFIN, O. A., Ann Arbor, Mich. (*Journal A. M. A.* January 6), regrets the lack of appreciation of the importance of eyestrain by so many members of the medical profession. The silence of so many of the text-books on internal and nervous disorders is another unfortunate fact and accounts in part for their common neglect by the practitioner. For the sake of brevity he groups the usual symptoms of eyestrain under the three heads of phenomena of (a) muscular asthenopia; (b) conjunctival and retinal irritation; (c) defective vision. Sensations of dizziness and nausea frequently result from these conditions, though they may also be caused by astigmatism, especially when the axes are at oblique angles. Aside from the direct symptoms or orbital muscular fatigue, congestion and lacrimation, and asthenopia, constant or accentuated by work, the systemic reflex symptoms are of still greater importance, and it is to these that he specially directs attention.

A muscular or refractive defect that in one person with ample reserve power may cause few or no disturbances, in another may seriously impair the vital functions, the causal ocular weakness being altogether unrecognized. Thus the ophthalmologist frequently meets cases of chronic headache, gastric disorders, nervous exhaustion, epilepsy, chorea, etc., that have resisted medical treatment but received permanent relief by the correction of an ocular defect. To illustrate his statements he gives histories of a number of cases of chronic headaches, insomnia, gastric disturbances, neurasthenia and other nervous symptoms, thus relieved in his practice. He notes an increasing interest in the subject as an encouraging indication, but states that there is yet room for improvement, both here and abroad.

New Test Types.

WILLIAMS, C. H., Boston, (*Journal A. M. A.*, Oct. 7, 1905) describes a set of test types on a plan first proposed by Dr. John Green of St. Louis, and arranged according to geometrical progression as recommended by him. The series is more complete than that of the usual Snellen types, being a series of letters with equal intervals between the different lines, but the shapes of letters and most of the Snellen lines are preserved. The letters are arranged on reversible slats or a rotating card, which can be controlled by the operator; the letters are illuminated by a steady electric light. Each line of letters is printed in duplicate with a different arrangement of the letters when reversed; this is a new feature, in test types of this kind.

The Success Which at the Present Day Attends the Operation of Cataract Extraction and the Causes that Contribute to It.

THEOBALD, SAMUEL, M. D., Baltimore, (*American Journal of Medical Sciences*, January, 1906), states that, "During the first half of the last century the most skillful surgeons were well content if in a series of flap extractions their failures did not exceed 12 per cent. During the two decades following the introduction of von Graefe's operation there was a definite improvement in the results secured, though 8 to 10 per cent. of failures were not uncommon. At the present day the operator whose failures exceed 4 or 5 per cent. has little ground for self-congratulation."

He quotes the statistics of Dr. Frank M. Ring (Medical Record, Feb., 23, 1895), of the results of over 2,000 cataract extractions by eminent ophthalmic surgeons in Europe and America. About half the cases were done with iridectomy. The percentage of failures in all was 3.67.

Theobald then seeks the causes of this markedly better showing which he attributes to several factors: the use of the combined extraction, the use of cocain and the application of the principles of aseptic surgery to ophthalmic operations. Among other causes of our success he mentions skilled nursing, improved hospital facilities and the use of appliances to prevent post-operative accidents, such as Murdoch's shield, and the masks of Emerson and Ring.

The question, Why do we not obtain still better results? is answered as follows: "in spite of the most careful antiseptic precautions, about 2 per cent. of the eyes operated upon are lost by pyogenic infection; that a not inconsiderable proportion of cataractous eyes are unsound in other respects, and therefore not capable of withstanding the shock of operation as they otherwise would; that as cataract is peculiarly a disease of advanced life the subjects of it are often not in the best condition for surgical procedures, 1 per cent. of them being glycosuric, 6 per cent. albuminuric, and a much larger proportion having atheromatous arteries; and, finally, that the temperament of the patient plays a not inconsiderable part in the outcome of every operation for cataract."

Every operator of large experience will approve of Theobald's remarks concerning the tractability of the patient.

"Only those who have had experience in ophthalmic surgery know how significant a factor this matter of the tractability or intractability of the patient is. The tractable patient is calm during the operation; does what he is told to do, and leaves undone what he is told not to do; directs his gaze upward or downward when so requested, and refrains from contracting his lids when warned that this is fraught with danger. In a word, he exercises self-control, and shows confidence in the skill and good intention of the operator. During the period of convalescence his behavior is equally irreproachable, and whatever the result of the operation, at all events, no blame can be laid at his door. Another patient, and our 'fellow citizens of African descent' supply many striking examples of this type, is the exact antithesis of this. If, during the most delicate step of the operation, he is told to look down, he is sure to look up; if cautioned not to nip his lids, he forthwith proceeds to contract his orbicularis with all the energy he can command. If warned not to move his head, he can be depended upon to give it a sudden jerk, and at the most inopportune moment.

When, after much tribulation, the operation is finally completed, his shortcomings still continue to manifest themselves. He is bent upon getting out of bed without assistance, after having been strictly warned not to do so; he partly removes the dressings from the eye which has been operated upon to 'try the sight,' and if told to open the eye for inspection or for the instillation of a drop of atropin, his levator palpebrae seems, on the instant, to become paralyzed, and he appears intent upon convincing you that his orbicularis has lost none of the energy which it displayed at the time of the operation. In a word *he,* from start to finish, does his level best, to use a slang phrase, to bring to naught the best efforts of the operator; and it goes without saying that he occasionally succeeds in doing this. Were those of his kidney eliminated, could they be—well, in some manner—sent to the 'place prepared for them,' and were our cataract patients always in sound health, and their eyes free from complicating diseases, then, indeed, would it be possible for the skilful operator to make very nearly a 'clean score.' "

Roentgen Treatment of Leprosy.

WILKINSON, H. B., Manila, P. I. (*Journal A. M. A.,* Feb. 3), describes leprosy as it exists in the Philippines, and especially the results of X-ray treatment of the disease. Inasmuch as leprosy often attacks the eyes, his article is of interest to ophthalmologists. The exact method of the spread of the disorder is obscure, and he concludes from his observations that it is rarely, if ever, transmitted from parents to offspring, and is with difficulty transferred from one person directly to another, but that frequently there seems to be a common source of infection to which members of the same family may be subjected, especially during early childhood. In the atrophic variety skin examinations for the bacillus may be negative though the organism may be found in the nerves supplying the affected parts. X-ray treatment was tried on thirteen patients and the results are given. The applications were made on the most affected portion of the body, they were continued usually for ten minutes, at a distance of from seven to ten inches. The distance and time of exposure were occasionally varied, the effort being made to approach as near as possible the point of burning without actually causing a burn. If burns occurred the treatment was suspended for a time, and they readily healed. Three of the patients are reported cured; one of these has died and the histologic and bacteriologic examination revealed no evidence of leprosy existing at the time of his death. The other two are apparently, and, it is hoped, permanently free from the disease. Seven patients are improved, there being marked decrease of leprotic deposit and the advance of the disease is apparently checked. Three patients remain unimproved. The cases in which recovery took place are reported in detail; one patient is still under treatment, though the manifestations of the disease have disappeared, and search for the bacilli is negative. Wilkinson is inclined to think that the X-ray cures by killing the bacilli, the bodies of which are absorbed and thereby produce an immunity against the living organism, the process being analogous to that in plague, in which immunity is produced by injecting killed cultures of the plague germ. In support of this he cites the following; The treatment of one leprous spot causes a parallel improvement in distant and untreated parts, and as complete as in the part directly treated. The best results seem to be obtained only when treatment is pushed to the point of killing or beginning to kill the tissues which would probably also be the death point of the organisms. Patients with localized massive leprous deposits are most rapidly improved. In these cases there is an abundant culture for the rays to act on, and the more quickly to produce immunity. In patients with diffuse general involvement of slight degree, or of atrophic character, with only a few scattered germs, Wilkinson has had little success. In two well-advanced cases with excessive new leprotic tissue, the improvement was marked and rapid, but was accompanied with a deterioration of the general health and rapid physical decline. This, he says, may be the result of an overdosage of necrotic elements. The article is illustrated.

The Early Ocular Signs of Dementia Paralytica.

HOLDEN, WARD A., M. D., New York, (*Jl. of Nervous and Mental Diseases*, November, 1905. Abstracted by Dr. W. W. Graves for the *St. Louis Medical Review*. The ocular conditions of seventy paretics in an early stage of the disease are recorded showing how far the pupillary disturbance may be of value in diagnosis. The method of examination is the following:

The patient should face the window squarely, otherwise the more strongly illuminated pupil may contract more than the other, because the consensual reaction is not always equal to the direct. After he has looked out of the window for a minute or two the patient is directed to look up at the ceiling. Since less light then enters his eyes his pupils dilate. Even with sluggish pupils the light reaction is well made out when the eyes are directed alternately from window to ceiling after remaining a minute in each position. But if the pupils are very sluggish, perhaps the best means of eliciting the light reaction is to have the patient first face the window and then turn his back to it. This is done with both eyes open and then with either eye closed.

The advantage of examining the pupils with the gaze directed toward the ceiling is that the reflex from the cornea does not lie over the pupil and obscure it. Any irregularities in shape can then be made out, and it is easy to measure the size of the pupils. While the patient is looking up, the consensual and direct reactions of each pupil may be obtained by covering and exposing each eye singly, with the other eye first open and then covered. With sluggish direct action we may expect sluggish consensual reaction, but rarely a loss of consensual reaction, as is sometimes stated.

In order to elicit the sensory reaction the skin of the neck is pinched several times in rapid succession, or the thumb nail is drawn sharply across the temple several times, when each pupil should dilate slightly. There are some sources of error in making this test. It has been advised to have the patient fix the observer's eye while the test is being made. The reaction so obtained is often well marked, but one cannot be sure that the dilatation is not due to a relaxing of the accommodation due to distraction of the attention when the skin is irritated. Personally, I prefer to make the test with the patient looking at a point on the ceiling. After the gaze has been directed upward a few seconds a spontaneous dilatation of the pupil often occurs, or there may be a continued oscillation or hippus, and this is particularly frequent in paretics. Hence the pupils should be watched until they are entirely at rest before the test is attempted, or better, the irritation of the skin may be continued for twenty or thirty seconds, and when the irritation is stopped the pupils will be seen to contract if sensory dilatation has occurred during the irritation. The sensory reflex is usually well marked in early life but in middle age it is slight, and in older persons it is often absolutely wanting. Physiological variations of pupils must be taken into account. Other things being equal, the pupils are somewhat larger in blue eyes than in brown. They are often quite large when the patient is myopic and small when he is hypermetropic, because the myope accommodates little and the hyperope accommodates excessively. Age and hardness of the vessels also have their influence. In childhood the pupils are large, in early adult life medium sized, and in middle age smaller.

The shape also varies with age. In early life the pupil is round, but in middle age some irregularity of the pupils can usually be made out if the ophthalmoscope is used or the irregularity may be sufficiently pronounced to be seen with the naked eye. Inequality of the pupils is too common to have much pathological significance. An excitation of the cervical sympathetic will cause a dilatation of the pupil on the same side, which may last a few minutes, or days, or even years. Similarly, contraction of one pupil may be brought about by a spastic contraction of the sphincter pupillae.

It is frequently stated that optic nerve atrophy is present in a considerable percentage of cases of paresis, at least in the late stages of the disease. Among these 70 patients there was no case of optic nerve atrophy and among some hundreds of patients examined at various stages I have rarely found pallor of the optic discs except when symptoms of tabes or of nicotin poisoning existed.

In recapitulation it is asserted, that in true, uncomplicated paresis there is early in the disease almost constant absence of the sensory reflex, in half the cases irregularity of the pupils, in nearly half inequality of the pupils, in more than half abnormally small pupils, in a fifth marked sluggishness of light reaction, and in a few of those with diminished light reaction a diminution of convergence reaction also.

While, as stated above, absence of the sensory reflex, miosis and irregularity of the pupils may not be of much significance in persons past middle life, they are of considerable diagnostic importance when they occur in earlier life; and Argyll Robertson pupils are, of course, of great significance, whatever the patient's age may be.

ABSTRACTS FROM FRENCH OPHTHALMOLOGICAL LITERATURE.

By David DeBeck, Sc. B., M. D.,

SEATTLE, WASHINGTON.

Action of Nicotin Upon the Cervical Ganglion.

Cosmettatos, (*Arch. d' Ophtal.*, 1904, p. 462), made a series of experiments on rabbits, dropping a 1 per cent. solution of nicotin upon the exposed upper cervical sympathetic ganglion. There followed secretion of tears, narrowing of the pupil, dilatation of the blood vessels of the conjunctiva and of the auricle, lengthening of the membrana nictitans, and prompt paralysis of the ganglionic cells. These, as comparative experiments show, completely lose the chromatic substance of their protoplasm. This paralysis is not preceded, as in experiments upon other animals, by a stage of irritation. The paralysis disappears after two weeks, although with stronger solutions it lasts longer. The cell structure has then again become normal; and irritation underneath the ganglion, which up to this time had been without effect, again becomes effective. The upper cervical ganglion exerts an independent tonic influence upon the eye; and the phenomena following cutting of the cervical sympathetic are much exaggerated after the cells of the ganglion have been paralysed by the nicotin solution.

These acute effects of toxic dosage are of interest, but throw no new light on the toxic amblyopia resulting from prolonged use in small dosage.

Relation of Corneal Opacities to Myopia.

Frenkel, (*Annales d' Ocul.*, Tome 132, p. 179), has made extensive and very careful investigations upon a long series of cases of corneal opacities. He found that this condition had, in one-third of the cases, brought on a progressive axial myopia, with alterations in the fundus. With bi-lateral occurrence of the opacities, lying in the pupillary area of the cornea, there resulted most frequently a binocular myopia. With a unilateral occurrence of the opacities there usually resulted a uniocular myopia; this was generally upon the same side—*but not always*. These opacities generally produce an astigmatism (of 1.5 to 2. D.); and this Ast. is in turn a factor in developing the myopia. Vision is reduced as a result of the opacities, and in turn becomes further impaired with the development of the fundus alterations arising in the development of the axial myopia.

Frenkel holds that the cases of unilateral myopia with unilateral maculae may be explained upon the correctness of the accommodation theory of the development of myopia. He believes, however, that in many cases there is an influence exerted by pathological processes in the anterior segment of the globe in the development of inflammatory conditions in the posterior segment, (sclero-chorioiditis posterior). Then again, the pathological changes in the anterior segment, and in the cornea itself, lead to a heightened resistance in the cornea and an increase of intra-ocular tension. The influence of this upon the stretching of the globe at the posterior pole, may have a decided effect. All these factors no doubt play a role in the pathogenesis of myopia as a result of corneal opacities.

Ophthalmometric Measurements of Corneal Curve.

Baslini, (*Arch. d'Ophtal.*, 1904, p. 565), has made an elaborate series of measurements of the corneal curvature, according to the method of Brudzewski only modifying it in his measurements of the corneal periphery. He gives numerous tables showing his results. The flattening of the corneal periphery is never sufficient to equalize the spherical aberration. He shows the relation of the central refraction in the principal meridians to that of the border zones; also the relation of this central astigmatism to the supplementary peripheral and to the total.

He also carefully studies the relation of the ophthalmometrically ascertained astigmatism to the subjective. In this latter the pupillary width is of influence.

Conjugate Ocular Paralysis.

Brissaud and Pechin (*Arch. d'Opthal.* 1904, p. 428), mark off from the not very sharply defined clinical group of conjugate deviations, a form of paralysis of the movements of the eyes to one side. They call this *hemiplegie oculaire.* The eyes can be moved to the right or to the left as the case may be; and only to the median line in the opposite direction. They take a position in rest corresponding to the changed muscle tonus, but without any spasmodic contracture of the antagonists of the paralysed muscles. They report a typical case in which there was left-sided facial paralysis. The eyes retained movement to the right, but to the left they could not be moved beyond the median line.

Nutrition and Nutritive Channels of the Eye.

Venneman (*Bull. Soc. d'Oph. de Belge* No. 16, 1904), gives an extensive and interesting review of the methods of nutrition in the eye, much of it based on experimental work. His views differ materially from those of other workers in many points. He premises that the eye is nourished by an arterio-capillary network from which the blood goes to a venous capillary net-work, and the lymph to a capillary lymph-network. Lymph-*vessels* are not found in the eye; even the chorioidal perivascular lymph spaces of Sattler Venneman does not recognize; and according to him both ocular chambers and the supra-chorioidal space are *serous cavities* and not true lymph spaces. These peculiarities explain why in localized ocular tuberculosis, this does not spread by means of the lymph channels as in other parts of the body, but the tubercle bacilli in the affected parts die out, without giving rise to generalized infection.

In the eye we meet three fluids: the blood-plasma, the connective tissue fluids, and the aqueous humor. The latter contains only the blood contents easily diffusible through the blood-vessel walls: salts, glycose, ferments, the easily diffusible albuminoids, toxins and proteolysin. Only through diseased vessel walls does blood albumin enter into the ocular fluids.

According to Venneman's conclusions the Fontana canals form not a filtration-angle, but an osmosis-angle. The intra-ocular tension is dependent upon the osmosis between the three intra-ocular fluids. An enucleated eye has a lowered tonus, because the vascular pressure fails. Put it in distilled water and the tension rises because in consequence of the osmosis water is drawn into the globe. Put it, however, in a 2 per cent. salt solution and the tension falls, on account of fluid being drawn out of the globe by osmosis into the salt solution.

Glaucoma After Cataract Extraction.

De Lapersonne, (*Arch. d' Ophthal.*, 1904, p. 341), reports a case in which six weeks after an extraction, *made with the iridectomy* glaucoma supervened. In the absence of other apparent causes, he was disposed to attribute this complication to an edema of the vitreous, and this in turn is due to an interference with the renal functions.

The curves showing the excretion of the urine and the chlorids both showed their minimum at the time of the outbreak of the glaucoma attack. The urine had shown a trace of albumen before the operation.

He advises, in cases that are at all suspicious, to examine the renal secretion, and particularly the excretion of the chlorids, so that by properly regulated dietetic and therapeutic measures these accidents may be prevented. According to the researches of Cantonnet in cases with normal renal drainage, one may apparently be able to regulate the eye tension either by the addition of salt or the withdrawal of salt from the diet; according as the cases are of one sort or the opposite, in respect to the excretion of the chlorids.

Cytotoxic Serums and Ophthalmia Sympathetica.

Le Play and Corpechot, (*Soc. de Biol. de Paris,* June, 1904), made an elaborate series of experiments by injecting pure cultures of bacillus pyocyaneus into the anterior chamber of the left eye (using rabbits), and making an aseptic wound on the right eye. In one series of these rabbits they injected an "ophthalmotoxic" serum (made by macerating rabbits' or guinea pigs' eyes) into the anterior chamber of the left eye, and subcutaneously into the belly; and in another series they injected a 7 per cent. salt solution into the anterior chamber of the left eye, and subcutaneously into the belly.

In the first series it was shown that general infection, and disease (*metastasis*) of the right eye was much more frequent than in the second series. Without taking up the argument in favor of the nerve paths as the track of the infection the authors believe that a cytotoxic serum (toxin) is generated and is necessary in the development of sympathetic ophthalmia. Charrin and Leri have shown in their series of experiments similar results. In a series of injections of pure culture of bacillus pyocyaneus in animals, metastases occurred in the liver, or in the kidneys, or in the nervous system according as a "hepato-toxic," or a "nephro-toxic," or a "neuro-toxic" serum (made similarly to the above), was used after the injection of the bacillus pyocyaneus.

Sympathetic Influence Following Wounds.

Sourdille (*Arch. d'Ophtal.,* 1904, p. 359), reports a number of cases, in which after injuries in no way severe, there developed in the other, hitherto entirely healthy, eye a keratitis or iritis. These proved of chronic and stubborn character, until treatment of the other (first injured) eye was instituted, when they recovered in short time.

The frequency of such cases proves some causal relation.

It is probably due to some disturbance of nutrition, spreading from the first affected eye, that such common affections are due. In the handling of some of these stubborn cases, these observations may prove of advantage.

SOCIETY REPORTS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

PRIESTLEY SMITH, F. R. C. S., President, in the Chair.

Thursday, January 25th, 1906.

SEPTIC THROMBOSIS OF CAVERNOUS SINUS.

Mr. Simeon Snell (Sheffield) related the following case:

On May 1st, 1895, a medical man pricked a small vesicle on the upper lip with a gold scarf-pin which had been used previously to open an abscess, and which was thought to be clean. The next day there was redness and swelling, and later on that day he was obliged to go to bed. On the 5th the condition of the lip was worse, and the blush extended to the left cheek and orbit. This was followed by proptosis and swelling of the conjunctiva and eyelids. Later the right side followed the same course, the proptosis being even more marked than on the other side. The movements of the eyeballs were interfered with, and there was paralysis of the right facial nerve and deafness on the right side, also dullness and evident effusion of the right side of the chest. The patient died fourteen days after the commencement of the illness, his mind having been unaffected throughout.

Mr. Snell remarked that the initial lesion was that on the lip, which the medical attendants had considered to be malignant facial carbuncle. No post-mortem examination was allowed.

ACUTE EDEMA OF EYELIDS.

Mr. Snell also related this case.

A pork butcher, aged 48, came to him with acute edema of the eyelids on both sides. The day before he had been dressing a pig, when the gut, which contained a large number of worms, burst, and the contents splashed into his face. The edema came on three or four hours later. When first seen by Mr. Snell, twenty-two hours later, the eyelids on both sides were intensely edematous, projecting as large semitranslucent swellings, leaving only a chink between them. There was considerable chemosis of the conjunctiva. The next day the swelling had much subsided, and the day after the condition of the eyelids had almost passed away, though the conjunctiva remained red.

The worms in the pig were the same class as *Ascaris lumbricoides,* and in seeking an explanation for the condition, Mr. Snell mentioned that it had been recorded that these worms, when alive, give off an irritating vapour. From another pig in which worms had collected together, the contents of the gut, and also nutrient broth into which some of the worms had been placed after having been cut to pieces, created no irritation when instilled into the conjunctiva of a guinea-pig.

THE TREATMENT OF DETACHMENT OF THE RETINA.

Dr. A. Maitland Ramsay read a paper based on a record of 50 consecutive cases of detachment of the retina treated in the Glasgow Ophthalmic Institution during the four years ended October 31st, 1905. The active treatment consisted in subconjunctival injection of 5 to 20 minims of 1 in 2.000 bicyanid of mercury, with 8 per cent. chlorid of sodium solution, the severe pain that always followed being mitigated by the addition of a few drops of 1 per cent. acoin solution. The injection was repeated as often as might be necessary at intervals of from four to six days, and if no decided improvement showed itself within a fortnight, free diaphoresis was induced by the subcutaneous injection of from 1/8 to 1/4 gr. of pilocarpin, this alternating with the subconjunctival injections. If the site and character of the detachment were deemed favorable, the subretinal fluid was always evacuated by scleral puncture. The patient was kept prone in bed with his eyes bandaged, and every effort was made to improve his general well-being, by careful attention to diet and to the action of the bowels, kidneys, and skin. Marked chemosis of the conjunctiva was essential, and when the reaction to the subconjunctival injections was absent or ill-marked, 1 to 2 per cent. of dionin was added to the bicyanid and chlorid of sodium solution. Of the 50 cases treated, 10 showed a decided improvement and 13 a moderate improvement, though of the former group 5, and of the latter group 2, relapsed at intervals varying from two weeks to four years. The more recent the detachment the more favorable the prognosis, but the pathological antecedents of the affected eye were more important than the duration of the condition. Failure was the rule in all cases marked by a seriously degenerated chorioid, a pupil sluggish to mydriatics, a much-diminished tension, and a red-colored separation. The method of treatment outlined was simple, applicable to all cases, and as far as the author's experience went, never did any harm.

BITEMPORAL HEMIANOPSIA.

Dr. D. J. Wood related a case.

The patient was a man, aged 33, who had suffered for over a year with frontal headache, failing vision, and loss of memory. The vision of the right eye was 1-60 and the left 6-60, and there was bitemporal hemianopsia with contraction of the field and loss of fixation in the right. He was mentally dull and forgetful, and there was marked delay in answering questions. The pupils were sluggish and the knee-jerks were almost absent. During the fifty-two days he was in hospital he grew worse mentally, and on account of his foul language and filthy habits it was impossible to keep him in. After sixty-two days, during which there was little change, he suddenly sat up and began to ask sensible questions, and when seen some months later he was mentally quite well. His right eye showed optic atrophy, was blind and divergent. The left improved to 6-18, his patellar reflexes were normal, and his memory for events after his sudden recovery was good. He had no recollection of anything during the previous three and a half months. His history was given by his wife, brother-in-law, and mother, who all agreed as to the details.

The case was thought to be one of cystic growth of the pituitary body, which during a fit of coughing had ruptured through the eroding bone and had escaped into the pharynx or nasal cavities; but nothing of this sort was noticed by the friends, and the patient was more or less unconscious until the actual relief of pressure had occurred.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

At a clinical evening on February 8th, Mr. Charles J. Oldham, Vice-President, in the chair, the following were among the exhibits: Messrs. Arnold Lawson and George Coats: preparations from a case of *Congenital anterior staphyloma,* previously brought before the Society by Mr. Lawson. The eye had spontaneously ruptured six weeks later. The central portion of the cornea was thinned and had a cicatricial appearance. There was a perforation, with a knuckle of retina between its lips. The lens capsule and iris were adherent to the back of the cornea. Owing to stretching the ciliary processes, pars plana, ora serrata, and anterior part of the chorioid were carried forwards witn the cornea. Owing to the firmer attachment of the ciliary body to the sclera, this had been left in its normal position. Thus the ciliary processes were further forward than the termination of Descemet's membrane, the pars plana was opposite the ligamentum pectinatum, and the ora serrata were actually in front of the ciliary muscle. Only one other case of the kind had been described, also in a case of congenital anterior staphyloma. The displacement was due to the fact that in fetal life the inner layers of the uvea were less intimately connected with the outer than was the case after birth; the same occurred in many of the lower animals, especially in birds. The staphyloma in this case was believed to be certainly due to intrauterine inflammation and perforation.

MR. HOLMES SPICER: (1) a patient, aged 48, who had always had *Myopia.* The left eye had been blind ever since an injury which occurred thirty years ago, and the right eye failed in 1901, and when seen there was total posterior synechiae and no P. L. The left eye had a corneal opacity and a tremulous iris, the lens was tilted and slightly dislocated backwards. It was quite opaque, and no fundus reflex was to be obtained. V. = P. L. with good projection. On March 3rd, 1903, a needle was introduced behind the ciliary body, and the lens was pushed backwards. Sight was at once obtained, and it had since improved. The vision was now about $\frac{6}{60}$. There was a large area of myopic atrophy of the chorioid about the disc, and the shrunken lens was visible at the bottom of the vitreous. (2) A case of *Superficial punctate calcareous deposit* on the cornea. The patient was a girl, aged 16. Her right eye was attacked by interstitial keratitis in June, 1897. She became deaf in 1902, and had an attack of interstitial keratitis in the left eye in 1905. This latter was severe, and led to much opacity, and to the development of salmon patches in two places, and a deposit of keratitis punctata at the back of the cornea. The left cornea had now cleared considerably; there was some deep opacity near the center, and numerous small light-brown or dirty-white dots exactly like keratitis punctata, but they were evidently close to the surface, and in front of the old interstitial opacity.

MR. LUDFORD COOPER: a girl, aged 11, suffering from *Elephantiasis neuromatosis.* There was much deformity of the right upper eyelid and temporal region. The lid was pendulous and greatly hypertrophied in all its structures. The lid was considerably everted. The patient was unable to raise it, and it could only be lifted with difficulty so that the small shrunken globe beneath it could be seen. The lens was opaque and the tension normal. The outer and lower portions of the frontal bone and of the squamous portion of the temporal bone were much more prominent on the affected side. The condition was slowly increasing and was congenital.

Mr. E. E. Henderson: a woman, aged 29, who had a *Growth on the upper palpebral conjunctiva.* For several weeks she had noticed something movable beneath her upper lid, and for three days it had protruded. An oval mass was found, about 2.5 cm. long and 1 cm. broad. Its surface was smooth and vascular, and was attached to the fornix by an elongated strip of conjunctiva containing vessels.

Mr. Sydney Stephenson: a boy, aged 9 years, who had a *Double detachment of the retina,* one at the upper part and one below. The tension was increased and the vision was bare P. L. Transillumination showed that light passed readily through both detachments. The other eye was myopic with some vitreous opacities. There was an obscure history of injury and a doubtful family history of tubercle. The question was one of diagnosis. Mr. Stephenson was inclined to think it was tuberculous.

Mr. H. H. B. Cunningham: a girl, aged 5, whose sight was noticed to be defective at school. In both eyes there was a *Semilunar gap in the lens,* at the lower part, more marked in the right eye; the suspensory ligament was here absent. There was no coloboma of either iris or choroid. The right eye was myopic, about 8 D, and the left about 3 D, but with astigmatism in both.

SECTION ON OPHTHALMOLOGY.—COLLEGE OF PHYSICIANS OF PHILADELPHIA.

I.

Meeting, January 17, 1905. Dr. George C. Harlan, Acting Chairman.

Keratitis Disciformis.

Dr. Wm. Campbell Posey exhibited a case of Keratitis Disciformis. This rare form of corneal disease occurred in a laborer forty years of age. The pupillary areas of both corneas were the seat of grayish-white opacities of a somewhat oval form, sharply defined from the surrounding clear corneal tissue by a grayish border which was rather denser than the rest of the opacity. Under the magnification of a corneal loupe, the epithelium over the opacity was found to be roughened but unbroken, and the opacities, which extended posteriorly into the substantia propria, resolved themselves into a number of small grayish dots. The center of the opacity was rather denser than the immediately surrounding area. The eyes were perfectly quiet, and there were no traces of vessels either upon the opacities or at the limbus. The author pointed out that Fuchs, who first described this form of corneal disease in 1901, believed it to be midway between ulcus serpens and the flat disc-like ulceration which follows herpes of the cornea. According to Fuchs's theory, the corneal disease is of ectogenic infection, while Von Hippel, who has studied a number of cases by staining with fluorescin, is of the opinion that the process is endogenic, and arises from a change in the endothelial cells lining the anterior chamber. Therapeusis is unavailing.

Gun-Shot Wound of the Orbit.

Dr. Posey presented a second note in regard to a case of Gun-shot Wound of the Orbit, which he had exhibited before the Section the previous spring. The skiagraph had showed that the bullet was lodged in the crotch of the optic nerve and globe, to the nasal side and slightly below, but at the time of operation the bullet was found on the floor of the orbit. The extraction was accomplished with conservation of the globe, after tenotomy of the internal and inferior rectus muscles. The ball weighed 160 grains. Considerable reaction followed the operation but subsided in a few months. The eye is now in a state of enophthalmus, and all of its motions are markedly restricted, except that given it by the superior oblique muscle, which has partially recovered its function.

Double Blepharoplasty.

Dr. Posey also exhibited a case of Double Blepharoplasty for the cure of cicatricial ectropion of both lids of both eyes, following a burn. A Wharton-Jones operation had been done upon the right lid and a modified Dieffenbach on the right lower lid. Both upper and lower lids of the left eye had been formed by large flaps taken from the arm. The transplantation flap on the upper lid of the left eye and the flap on the upper right lid obtained by the Wharton-Jones method gave good results, but both lower flaps had sloughed.

Simultaneous Contrast Color-images.

Dr. Charles A. Oliver read a paper upon his findings in a series of Simultaneous Contrast Color-images which had been suggested to him by Dr. S. Weir Mitchell who had observed some curious visual phenomena while gazing at some of the cascades in Japan; these phenomena consisting of isolated foam-like and rapidly descending masses, showing a color dis-play of brilliantly tinted lines which fell and broke at corresponding depths with all the glow of prismatic scintillations.

As a result of two years' work, in which more than one thousand experiments were conducted upon some six hundred subjects, he summarized his results in the following statements: (1) Simultaneous color-contrasts may be obtained through healthy visual apparatuses by the sudden repetition of imperfectly perceived areas of white; (2) the first contrasts noticed from fixed forms of white on black consist in constantly changing and irregularly grouped areas of uncertain "salmon reds," which assume varying tints dependent upon the shape, the degree of movement, and the relative sizes of the moving objects; (3) the secondary contrasts are fully complementary in values to the primary subjective "reddish" colorations, and consist of evanescent green borders, flecks, and bands, which appear alongside of the white objects, in front of the red subjectivisms, and on deeper and apparently farther removed planes of vision; (4) When the objective "whites and blacks" are more ephemerally perceived, both the "red" and "green" subjectives appear simultaneously in consecutive bands, stripes, arrows, wedges, and all manner of anomalous forms, dependent upon the shape of the objects exposed, the rapidity of their movements, and the character of the individual visual apparatus; (5) all of these subjective manifestations are preceded by a brief impression of grayish or smoky areas varying in intensity and momentarily projected and depressed: (6) in many cases, after and even during the appearance of the green-red complements, numerous blue-yellow tints appear in definite complementary relationships, some especially in the peripheral portions of the field; (7) many of the higher grade observers reported a number of the secondary and even tertiary color combinations which were usually seen as fleeting spots and stripes, these results obtained in addition to the phenomena of the ordinary color fatigue expressions; (8) cases of subnormal color perception reduced in the ordinarily understood recognition of green, failed to evolve any properly tinted "green," as was shown by having these subjects select the tints they had seen from carefully chosen color-tests wools. Neither did these cases obtain subjective expressions of the complement "red"; (9) cases of subnormal color perception lowered beyond that of the ordinary recognition of green and red, invariably reported "misty appearances," "grayish clouds," etc.. followed by blueyellow complements, but never noted any "green" and "red."

Treatment of Infection Following Cataract Extraction.

Dr. H. F. Hansell presented a paper on the Treatment of Infection Following Cataract Extraction Statistics collected from the reports of several operators of large experience give 1 per cent. to 4 per cent. of cases of infection, the ratio decreasing in direct proportion to the strictness of the observance of antisepis in the preparation of the patient, instruments, and operator. The treatment consists of (1) Preventive measures; the exclusion of conjunctival and lacrimal disease, of the staphylococcus, streptoccus,, the gonococcus, or diphtheria germ; the exclusion of sources of endogenous infection such as inflammatory foci in any part of the body, active constitutional diseases, necrosed bone, carious teeth, and most forms of facial skin disease: (2) Preparation for operation by thorough antisepis.

If infection appears the local therapeutics consists of (1) cauterants to the wound—carbolic acid, galvanic or actual cautery; (2) subconjunctival injections of bichlorid or cyanid of mercury; (3) the introduction into the anterior chamber of iodoform rods or discs, and (4) the injection into the interior of the ball, preferably into the anterior chamber through the cornea, of bichlorid solution 1-3000 by means of an hypodermic syringe. In one case the writer had made daily application of pure carbolic acid to the purulent edges of the wound for ten successive days. The infective process was checked and the eyeball saved. In another case, after the failure of this treatment, the injection into the ball of 5 minims of 1-3000 bichlorid caused a rapid disappearance of the white mass in the pupil and anterior chamber. The patient recovered with useful vision.

Discussion;—Dr. de Schweinitz believed that the lacrimal secretions were a frequent cause of infection after cataract extraction, although a certain number of cases could be traced to solutions used in the attempt to sterilize the field of operation. He has abandoned washing out the conjunctival sac in individuals with deep orbits, as the eye becomes submerged in the cup of fluid formed, carrying possible infection to the wound. He cited five cases of infection occurring in his experience, one due probably to infection from the lid margin, one to extensive facial eczema, one to lacrimal disease, one to douching the conjunctival sac in a patient with deep orbit, and one directly traceable to a normal salt solution prepared by a careless drug clerk from impure water. In collapse of the cornea in old people he adhered to the plan suggested by Knapp, of filling the anterior chamber with normal salt solution to prevent the suction of conjunctival fluid into the eyeball. If infection occurs, he had relied upon applications of carbolic acid to the wound, or the use of the actual cautery and drainage of the anterior chamber. His experience with the introduction of iodoform rods into the anterior chamber under these conditions had not been favorable, and he did not think it did much good. Argyrol he considered of value as an antiseptic, and he thought dionin worthy of trial in post-operative iritis.

Dr. Ring referred to two cases of infection, one of which followed a drop of homatropin solution instilled in the conjunctival sac shortly before operation by the nurse who used a solution from the out-patient clinical department. Applications of carbolic acid to the wound limited the infection, and the ball was saved. In the second case the patient tore off the bandages a few hours after operation; resulting in infection of the wound. The eyeball was saved by applications of 1-1000 bichlorid solution, but vision was lost.

Dr. Zentmayer was pleased to hear Dr. Hansell speak of endogenous infection as he wished to believe that a recent case of panophthalmitis following cataract extraction in his practise was of such origin. The patient was a debilitated woman of seventy-six years. There were no complications until the eighth day, when the wound was found to be opaque white throughout its extent. Thorough cauterization, iodoform in the conjunctival sac, and dionin did not prevent phthisis bulbi. Enucleation was declined and the patient now has the unusual sequel of sympathetic iritis.

Dr. Ziegler referred to a case of infection from conjunctivitis occurring at the Wills Hospital one week after extraction. The wound was cauterized and the anterior chamber irrigated with 1-3000 bichlorid solution, the eyeball being saved. In three other instances occuring in his service at the St. Joseph's Hospital, during the past sixteen years, the infection was believed to be due to the lacrimal canal. In two of the cases the purulent process was subdued by 1 per cent. solution of formalin carefully applied to the wound, and the eyeballs were preserved. In certain cases where lacrimal disease was suspected he favored as a prophylactic measure the employment of three stitches to keep the wound in apposition, and antiphlogistic treatment by the constant use of ice pads, hourly irrigation with 1-8000 bichlorid solution, and the omission of a bandage.

Dr. Harlan had succeeded in arresting the purulent process by cauterization and the daily application of peroxid of hydrogen to the wound.

Double Perforation of the Sclera.

Dr. William M. Sweet exhibited a case of Double Perforation of the Sclera of the left eye by a strand of brass wire, 3 mm. long, from the winding cable of an old clock, the particle entering the eyeball on the temporal side, 4 mm. from the limbus, and lodging in the orbit 5 mm. back of the globe and above the optic nerve. The boy had been under treatment for ten days for conjunctival ecchymosis of the right eye following a blow from a snowball, and casually mentioned that sight of the left eye was failing. Examination showed hemorrhage in the vitreous with upper temporal quadrant. Inquiry developed that the previous day the wire cable of a clock had parted while he was winding the spring, and the drum rapidly unwound, causing the end of the broken cable to strike the cross supports of the works. He felt a "spark" strike the face, but was unaware of injury to the eye. Dr. Sweet believed that complete penetration of the eyeball by pieces of metal was more frequent than the published cases would seem to indicate.

Papilloma of the Lacrimal Caruncle.

Dr. C. A. Veasey reported a case of Papilloma of the Lacrimal Caruncle observed in a man, twenty-seven years of age, who had received a blow upon the eye two years before. There was a large cauliflower-like growth, 7 mm. in diameter, attached by a pedicle to the lacrimal caruncle of the left eye, and two smaller similar growths of the plica semilunaris about 5 mm. distant, also attached by pedicles, and connected with the first strip of hard cartilaginous-like tissue. The growths were excised, the bases cauterized and microscopic examination proved them to be papillomata.

Leuco-Sarcoma of the Chorioid with Secondary Involvement of the Ciliary Body.

Dr. Veasey also reported a case of Leuco-sarcoma of the Chorioid with Secondary Involvement of the Ciliary Body observed in a married woman, fifty-nine years of age. The eye symptoms began twenty months before she was seen by Dr. Veasey as "flashes of light" and "black spots" before the eye. The growth was not discovered until she had been blind for a month and Dr. Veasey did not see her until three months later when there were present all the symptoms of secondary glaucoma and a cataractous lens. The eye was enucleated. Microscopic examination showed a large leuco-sarcoma of the chorioid with secondary involvement of the ciliary body, the main portion of the tumor being composed of spindle cells, but with superficial portions partaking of the character of endothelioma.

Blocking of the Lymphatics of the Anterior Segment of the Eyeball.

Dr. William Zentmayer presented a case of probable Blocking of the Lymphatics of the Anterior Segment of the Eyeball with inflammation of the perilymphatic tissue, following the use of subconjunctival injections of normal salt solution for the cure of detached retina. After about 10 injections there was so much inflammation of the conjunctiva and episcleral tissue that their use had to be abandoned. Upon subsidence of the acute symptoms small yellowish nodules, with minute superficial ulceration, appeared above each cornea; these increased and coalesced until a placque reaching from the upper margin of the cornea to the cul-de-sac was formed. This is waxy and coarsely granular in appearance and the overlying conjunctiva is injected. The condition has existed about five weeks. He referred to a case seen in consultation where there was a similar coarsely granular condition over the whole anterior aspect of the sclerotic. There were no inflammatory symptoms and no coloration. Questioning elicited the fact that the patient had received a course of subconjunctival injections some time previously in the treatment of interstitial keratitis.

Papilloma of the Conjunctiva.

Dr. B. Alex. Randall exhibited a patient, seventy years of age, with lacrimal conjunctivitis and Papilloma of the Conjunctiva. The latter consisted of a point of red raised papilla in the center of the conjunctiva of the lower lid near the margin. The punctum was widely everted by the swollen conjunctiva adjoining it, but the rest of the lid showed slight tendency to inversion. The patient had an interesting history of which the most pertinent facts were that both eyes suffered exclusion of the pupil after iritis from exposure when the extremities were frost-bitten, and he has suffered later reamputation of the stumps at various times through the past twenty-three years to the number of upward of thirty operations. The iridectomy of his right eye gave temporary vision, but was followed by advance of the cataract already present and its extraction was followed soon by corneal involvement ultimately destroying all sight. The left eye, which had been shrunken, soft and retaining bare projection of light, filled out after the iridectomy and became more normal and he could count fingers at one foot through the unclouded periphery of the lens. After the loss of the better eye this still further improved especially with the advance of liquefaction of the lens which now is apparently absent, leaving a tremulous iris, but in reality is almost wholly transparent with its Morgagnian nucleus fallen out of the line of the iridectomy up and in. With his cataract glasses he now has vision one-fifth of normal and reads ordinary print readily. Crippled as he is by the loss of both feet and almost all fingers he is yet earning his support as a traveling agent. The lacrimal conjunctivitis annoys him greatly and demands relief, and he is presented with the question whether astringents may be safely used without stimulating growth of the papilloma, or whether this should be removed with a strip of conjunctiva so as to invert the displaced punctum?

William M. Sweet, M. D.,
Clerk of Section.

Meeting, February 21, 1905. Dr. Geo. E. de Schweinitz, Chairman, presiding.

The Treatment of Internal Ocular Inflammation by Diaphoresis.

Dr. H. F. Hansell read a paper on The Treatment of Internal Ocular Inflammation by Diaphoresis, describing two cases of acute chorioiditis and one of chronic uveitis in which the remedial effect of sweats was marked. .The first was that of a man weighing 234 pounds who had lost the vision in the left eye until only L. P. remained. In the chorioid just above the foveal region was a dense mass of pigmented exudate and the vitreous was filled with fine opacities. The patient's weight was reduced 29 pounds after twelve successive hot baths and profuse sweating, and the vision was restored to the full acuity in twenty-one days. The second case closely resembled the first in the nature of the affection and in the prompt and complete recovery. The third was less tractable, the man having suffered with a low grade uveitis for eighteen months. The final result, however, was equally satisfactory. The writer relies mainly upon the hot bath, hot-water bottles, and blankets for the induction of the sweat and reserves pilocarpin for patients who do not readily respond to the simpler treatment. In conjunction with the sweats he recommends the use of mercurial inunctions and, after the patient has regained his liberty, the administration of potassium iodid.

Discussion.—Dr. Pyle referred to a case resulting in death from the employment of pilocarpin in the production of diaporesis and commented favorably upon the omission of this drug in the method advocated by Dr. Hansell.

Astigmatism After Simple Extraction, as Modified by the Conjunctival Flap.

Dr. C. F. Clark, Columbus, Ohio, (by invitation) presented a paper on Astigmatism after Simple Extraction, as Modified by the Conjunctival Flap, which was a supplement to a paper published by him in 1899. He stated that while in moderate degree post-operative astigmatism is of common occurrence, it must be looked upon as an evidence of some defect in the operation, or the healing process. As it may be accurately measured, it serves as a gauge of the accuracy with which the edges of the wound have remained in coaptation. Having in his former paper made a comparison of the average degree of astigmatism in a series of 30 cases of simple extraction, taken from his own practice, with the same number of cases of extraction after preliminary iridectomy taken from the practice of Dr. J. A. Lippincott, the writer in his present series, attempts to show the effect upon the degree of post-operative astigmatism produced by a modification of the incision, and a change in the after-dressing. His former incision was in the line of separation between the clear cornea and the limbus, with sometimes a slight turning forward of the knife in completing the section, while in the latter series the section was all in a plane parallel with the iris but far enough back to form a good conjunctival flap. In spite of its manifest disadvantages in other respects, owing to its safety in so far as prolapse is concerned, and the desire to make a fair comparison, the writer adhered quite consistently to this procedure.

From a consecutive series of some 30 cases were excluded: first, all cases of complicated cataract; second, all in which an iridectomy was performed; third, all cases of simple extraction in which, owing to the presence of an undivided secondary membrane, or from any other cause, vision equal to 20/40 had not, as yet, been obtained; and fourth, those cases which failed to report for further study. The average primary astigmatism in 6 cases, nine days to six months after operation was 2.82 D. The average for 9 cases, nine days to six months after operation was 2.66 D. The maximum primary astigmatism was 4 D., the minimum 2 D. Average vision was 20/27.277+ = (5/7X). This amount of astigmatism was below that given as the usual average and a distinct gain over the former series without the conjunctival flap in which the average was 3.95 D.; but the results obtained by this method so far as astigmatism is concerned were still unequal to those secured by Lippincott who employed the preliminary iridectomy, his average being only 1.5 D., though, owing to the iridectomy downward, or some other cause, his visual results were not so good.

Discussion.—Dr. Harlan stated that it was his custom formerly to make his section in the cornea, but he now preferred to make it in the limbus with a small conjunctival flap, and always performed extraction without iridectomy in uncomplicated cases. He had made no comparative studies of the amount of astigmatism produced by the different methods.

Dr. Ziegler believed that the proper corneal curvature is best maintained by keeping the knife continuously in the same plane in making the section. Prolapse of the iris, in his opinion, is largely due to neglect of this procedure, it making no material difference whether the section is placed in the cornea or conjunctiva.

Dr. Hansell stated that he preferred preliminary iridectomy, if possible, and had recently avoided the employment of fixation forceps in performing the operation. He was inclined also to avoid the making of the section back of the limbus.

Dr. Clark, in closing the discussion, thought it probable that the downward section employed by Dr. Lippincott might account for the lower average of astigmatism in the published statistics of the latter.

Paralysis of the Upward Movement of Both Eyes.

Dr. W. Zentmayer reported a case of Paralysis of the Upward Movements of Both Eyes observed in a strong, well-nourished man, aged fifty-seven years, who drank and smoked to excess. An attack of dizziness on the night preceding the onset of the muscle trouble was followed in the morning by diplopia and foggy vision when attempting to read. Upward movement of each eye was entirely abolished either separately or conjugately. Convergence was weak and unsteady and accompanied by tremor of the inferior fibers of the orbicularis. Lateral conjugate movements were full but nystagmic. Diplopia could not be elicited. The iris of the right eye was prompt to light and somewhat more active than that of the left. Vision of O. D. = 6/9; O. S. = 6/12. The fields were greatly contracted both for form and color and there was a low-grade neuro-retinitis with slight contraction of the arteries and distention of the veins. Two weeks after the onset vertical diplopia was first complained of and was found to be due to greater weakness of the left superior rectus than of the other muscles. Three weeks later objectively the movements were full but a slight paresis of the left superior rectus could still be demonstrated.

An examination by Dr. W. G. Spiller showed no signs of disease of the nervous system other than those found in the eyes. His opinion was that there was a vascular lesion near the aqueduct of Sylvius involving the nuclei of the third nerve, probably due to alcohol.

Traumatic Aniridia.

Dr. de Schweinitz described a case of Traumatic Aniridia with the following history: Twenty-four hours prior to his examination, a man, aged thirty-six years, his eye previously having been entirely healthy and normal in all respects, struck it against a sharp, projecting iron post. He was wearing spectacles at the time and these were shattered by the blow. When examined, the following conditions were present: Vision equaled light perception; there was a red reflex from the fundus, but the details could not be seen on account of the blood-stained vitreous. There was complete aniridia and equally complete aphakia. A cut 1 cm. in length extended along the lower corneo-scleral border incising this tissue as cleanly as if the cut had been made with a knife. From this incision some vitreous protruded.

The treatment consisted of iced compresses for two days, calomel, followed by large doses of salicylate of sodium. At first there was little pain, but after a week there occurred, almost at regular intervals of two and one-half hours, sharp attacks of ciliary neuralgia, followed in a few seconds by profuse lacrimation. Gradually these phenomena disappeared, and at the end of a month the eye was practically free from irritation, and with a suitable correction, namely S. 9 D. ○ + C.75 D., axis 150°, vision 5/5. The eyeground was normal, and the media, with the exception of some stringy opacities in the vitreous and a grayish veil in its lower portion, entirely clear. Previous to the accident the eye had been myopic 3 D. It is probable that the lens carried the iris with it when it was dislocated through the opening, although it is possible that the grayish veil in the vitreous may have represented the remnants of the iris.

The points of interest evidently were the perfect healing after so serious a wound with normal vision, the periodic attacks of pain lasting for nearly three weeks, and the control of the whole process by massive doses of salicylate of sodium.

Three Cases of Sarcoma of the Chorioid and One of Glioma of the Retina.

Dr. G. E. de Schweinitz and Dr. B. F. Baer, Jr. (by invitation) exhibited the macroscopic and microscopic specimens from the following Three cases of Sarcoma of the Chorioid and one of Glioma of the Retina:

1. A woman, aged thirty-six years, whose eye was enucleated in the stage of absolute glaucoma. It was found to contain a large pigmented sarcoma of the small polymorphous-celled type, containing huge areas of necrotic material and extensive hemorrhages, which probably caused the violent glaucomatous symptoms which she had at the time of enucleation. The probable period between the first appearance of the sarcoma and the time of absolute glaucoma was in the neighborhood of six years. At the present time, sixteen months after enucleation, there is no sign of recurrence.

2. A woman, aged fifty-four years, with the right eye in the stage of fungus hematodes. Only the posterior half of the eyeball existed, and from it protruded a fungous mass, which measured 4 cm. in length and 2½ cm. in width, and which protruded between the fissure of the lids. The tumor was made up of round and oval cells of the sarcoma type, with very large nuclei and a minor amount of protoplasm. The growth was exceedingly vascular, the vessels being of the embryonic type. Around its borders there was considerable pigmentation. In addition to the fungous mass protruding anteriorly, there were large posterior extrascleral nodules. There has been no sign of recurrence since the operation, four months ago.

3. A man, aged forty-eight years, had been blind in his left eye for eight months, and four months prior to his visit had been told that he had detachment of the retina. For three days he had suffered intense pain, and when he was examined there was extensive chemosis of the lids, enormous chemosis of the bulbar conjunctiva, the eyeball being practically fixed in its movements, with excruciating pain which radiated above and below the orbit. The tension was +3 and there was a special area of induration in the lower half of the eyeball. On enucleation of the eye, the orbit was found free, but a small flat sarcoma was seen within the globe to one side of the optic nerve entrance. Examination proved the growth to be a moderately pigmented, spindle-celled sarcoma.

The case was interesting on account of the intense severity of the glaucomatous symptoms, simulating as they did, orbital cellulitis. There was complete occlusion of the angle of the anterior chamber by adhesive inflammation between the root of the iris and the posterior surface of the cornea.

4. A girl, aged four years, when examined, was found to have a normal right eye, but in her left eye were the typical

signs of glioma. Not only could the gliomatous growth be seen through the pupil space, but a number of small, yellowish nodules were scattered over the iris. The eyeball was enucleated and found to be entirely filled with the gliomatous tumor, which contained the usual so-called glioma cells in the form of mantles around vascular channels, interspersed with areas of necrosis. Rosette formation was not found. The optic nerve was well infiltrated with glioma cells, and the nodules in the iris had a similar structure. The patient had not been seen since the date of the operation, six months ago, nor could her subsequent career be ascertained.

Discussion.—Dr. Hansell inquired whether the *x*-ray examination would not reveal the presence of a particle of glass within the eye, stating that he had seen a case in which a distinct shadow was observed in the skiagraph.

Dr. Sweet believed that it should be possible to secure a shadow of glass in the eye with an *x*-ray tube of medium penetration and short exposures. He called attention to the case reported by him before the Section several years ago of an engineer injured by the explosion of a locomotive glass gauge. A piece of the glass was located by the *x*-ray close to the ciliary body, and was removed by forceps with preservation of the eyeball. In an injury from the explosion of a glass laboratory flask, Davidson located a piece of glass in the eyeball by means of the shadow on the radiographs, subsequent enucleation verifying the *x*-ray findings.

Dr. Clark had observed two cases of suspected glass within the eye in which x-ray examination gave no assistance in the diagnosis. Although his experiments with lead-glass produced shadows, while other varieties of glass gave negative results, he was inclined to believe that the thickness of the particle of glass had much to do with the result obtained.

Dr. Harlan related the history of a boy, aged sixteen years, who had been struck on the eye by a tin horn thrown by another boy on the opposite side of the street. No iris or lens was found at the examination, but upon later inspection scars were discovered upon the lower lid and in the upper ciliary region showing the eyeball had been ruptured *contre-coup*. Vision ultimately equaled 20/30 with spherical correction.

Dr. Pyle emphasized the point that it was somewhat difficult to ascertain whether aniridia was present or not in old cases and inquired whether transillumination had been employed in the cases reported, or in any of the cases of intraocular tumors, to assist in the diagnosis.

Dr. de Schweinitz stated that although the *x*-ray examination had been repeatedly made in the case of traumatic aniridia, the results had been negative, and indeed, they might have been expected to be so, as he understood that glass, except lead glass, did not show in an *x*-ray plate, at least, so he was informed by the expert who made the skiagrams. He was aware that glass had been shown on *x*-ray plates, but supposed that it was not such glass as that of which spectacles were manufactured.

He stated, also that he had made some experiments in a rather crude manner to endeavor to demonstrate the value of transillumination, but had not employed the apparatus which Dr. Pyle had described, the one which he had used being somewhat on the princiiple of the small electric bulbs used by the larynologists. He had not, however, made any examinations of eyes which contained morbid growths, and could not from his own experience state the value of this method as a diagnostic procedure.

A New Ophthalmic Outfit for Bedside Examination.

Dr. Edward A. Shumway exhibited a New Ophthalmic Outfit for Bedside Examination, which was designed for use in general hospital wards, or for private work. It consisted of a hand perimeter case into which were fitted spaces for an ophthalmoscope, lens for oblique illumination, trial frames (with a few spherical lenses, red glass, stenopeic slit, prism, etc.), distance and reading cards, with which the ordinary functional tests could be made.

C. A. VEASEY M. D.
Clerk of Section.

III.

Meeting, March 21, 1905. Dr. G. E. de Schweinitz, Chairman, presiding.

Purulent Inflammation of the Frontal Sinus, Simulating Disease of the Lacrimal Sac.

Dr. William M. Sweet exhibited a case of Purulent Inflammation of the Frontal Sinus, Simulating Disease of the Lacrimal Sac. An ivory exostosis, measuring 41 × 25 mm. had been removed from the inner orbital wall nine years before by Dr. Wm. F. Norris, the tumor involving the plate of the ethmoid bone in its entire extent and also invading the lacrimal bone. Epiphora and a slight discharge of pus at the inner canthus continued since that time. Six months ago an acute edema of the eyelids and face of the right side occurred, and subsided after evacuation of an abscess over the lacrimal sac. Examination a month ago showed a purulent discharge from an opening below the internal commissure, increased by pressure over the sac. Failing to relieve the purulent condition by irrigation and dilatation, an incision was made over the lacrimal sac, and a large probe passed upward in the direction of the ethmoid was followed by evacuation of several ounces of pus. The parts were curetted, irrigated, and a drainage tube inserted. The direction of the drainage tube was upward and slightly backward, and it was believed that the source of the infection was in the anterior cells of the ethmoid, but a radiograph made of a piece of fuse wire in the lumen of the tube showed that the tube, after passing slightly backward for a distance of about one and a half inches curved forward and entered the frontal sinus. The case was of interest as showing the value of the Roentgen rays in tracing the source of the purulent infection in instances of sinus disease.

Discussion.—Dr. Risley inquired whether it was not probable that in operating for the exostosis the ethmoid or frontal sinus may have been opened and infected. It is his custom to make a free opening in this class of cases and always to drain through the nose.

Unusual Changes in Refraction.

Dr. S. D. Risley read a paper concerning Unusual Changes in Refraction and presented briefly the history of two patients in whom marked change in the refraction of the eyes had been observed.

In Case 1, in 1893, he had prescribed, after prolonged mydiasis, for right eye +2.50⊃+.50 C. ax. 105°; left eye + 2.50⊃+.50 C. ax. 65°; V. =6/6 in each. These glasses had been worn constantly until June, 1902, when complaint was made of blurred vision, and careful study of the static refraction gave for O. D. + 350, V. 6/7½, O. S. + 75, V. = 6/15. Macular disease was observed in both eyes and gray posterior capsule in left, but no demonstrable swelling of the lens. In November, 1902, there was no change in refraction of right eye, but in the left M. = 1.50 D., which in June, 1903, had increased to —5 D., making a total increase of 7.50 D. No further change has occurred to present date and no notable change in condition of lens. There was fluid vitreous, floating opacities and progressive increase in the macular chorioiditis.

In Case 2 severe asthenopia had been completely relieved by the following glasses from 1895 until 1902: O. D. + 1.50 ⊃ + .62 C. ax. 60°, V. =6/6;O. S. + 2 ⊃ + .50 C. ax. 105°,

V. = 6/6 The glasses were prescribed after repeated examination under a strong mydriatic. In 1905 the asthenopia returned with recurring attacks of migrain. A strong mydriatic was again used resulting in the following correcting glasses: O. D. + 2.75 ⊃ + 1.00 C. ax. 30°; O. S. + 3.25 ⊃ + .50 C. ax. 105°. There was also a left hyperphora of 2°. Dr. Risley could find no sufficient explanation in second case, except that many days' use of a strong cycloplegic had not in the first examination been sufficient to cause complete relaxation of the accommodation.

Discussion.—Dr. Carpenter referred briefly to those cases in which considerable change was noted in glycosuria, in the formation of cataract, and in iritis. In his opinion, cases like the last of Dr. Risley's could only be explained by assuming that complete paralysis of accommodation was not obtained at the first examination.

Dr. de Schweinitz thought that the first case which Dr. Risley had reported was best explained by an increase of refraction due to changes in and around the nucleus of the lens, because it was well known that even when such alterations were not very visible, they none the less occurred. He thought that the point could very positively be determined by an examination with the retinoscope of the refractive condition of the center and of the periphery of the lens.

The second case appeared to him to be explained, as Dr. Risley himself had suggested, by the fact that at the primary examination full paralysis of accommodation had not been obtained. He also referred to the possibility that alterations in refraction might have had some connection with changes in the body-weight of the patient, or, in other words, with alterations in his nutrition.

Dr. Pyle spoke of the changes in refraction incident to alteration in body-weight. He called attention to the fact that, in the cases of increasing myopia associated with glycosura, with the subsidence of the systemic affection, there may be a return to the former refractive condition.

Epiphora Unassociated with Lacrimal Obstruction.

Dr. John T. Carpenter presented a paper on Epiphora Unassociated with Lacrimal Obstruction. After calling attention to the fact that in obstructive epiphora the secretion rapidly becomes catarrhal or purulent—an important diagnostic point—the present views as to the origin of the secretory fibers for the lacrimal gland were discussed. Epiphora from oversecretion might be due to: (1) Psychic causes; (2) reflex; (3) from stimulation of the secretory center. The cases presenting nonobstructive epiphora were grouped as follows: 1. Epiphora in refractive and muscular anomalies. 2. Reflex epiphora. 3. Epiphora in nervous affections. 4. Idiopathic epiphora. The epiphora of refractive errors is most marked in on-coming presbyopia and hyperphoria and disappears on correction of the refractive error or muscular anomaly. Reflex epiphora is found in intranasal diseases, in ocular inflammatory affections and occurs in nervous and hysterical patients, excited by exposure to smoke or cold or other trifling causes. The results of treatment in this class of patients are not satisfactory, but no surgical treatment to the lacrimal apparatus is permissible. Epiphora in nervous patients has been noted in facial palsy, tabes and syringomyelia. The clinical notes of a case were given in which marked epiphora was apparently due to a central irritative lesion of specific nature. The mechanism of epiphora in facial palsy and tabes was believed to be in some instances due to hypersecretion analogous to the other vasomotor neuroses seen in this disease. The full clinical notes of a case of Basedow's disease were given, in which *early epiphora* and tachycardia were the only symptoms; and the diagnosis was made by examination of the eyes, though in five months time all of the classic symptoms of exophthalmic goitre have appeared. The author believes with Berger that the epiphora in this case was due to hypersecretion of central origin.

Discussion.—Dr. Risley referred to a case of Bell's palsy occurring in a patient, aged four years, upon whom at the age of twenty-eight he had operated for the relief of the epiphora and the widened palpebral fissure. The operation consisted of approximating the lid margins at the outer angle, after denuding the edges, and in suturing them in such a way as to shorten slightly the lower lid. This brought the lacrimal punctum in apposition with the eyeball.

Dr. de Schweinitz indorsed Dr. Carpenter's conclusions in regard to epiphora, and agreed with him that the necessity was great for investigating the factors which might be potent in its production from all standpoints before submitting canaliculi and ducts to unnecessary surgical interference. He referred to the frequency with which not only early presbyopia, but early presbyopia associated with cataract formation in its incipiency, was connected with epiphora, and thought this might indicate disturbances of the uveal tract, which in their turn, as Dr. Risley had so often insisted, were important from the etiological standpoint in the development of lenticular changes.

Metastatic Ophthalmitis.

Dr. G. E. de Schweinitz read a paper Concerning Metastatic Ophthalmitis, and reported the following case which developed thirty-one days after confinement: A woman, aged thirty-nine years, a multipara, twelve days after normal labor and without preceding indications of any kind, had a sudden violent uterine hemorrhage. For the following eight days no complications appeared, but on the ninth day sudden severe pain began in the left gluteal region, which later extended along the sciatic nerve of the same side, and involved also the hips, knees, shoulders and wrists. These phenomena were accompanied by fever and headache, but an initial chill was not noted. Amelioration of these symptoms took place during the following nine days and the patient was seemingly making a satisfactory convalescence when pain in and around the right eye developed. Vision was greatly blurred but not lost, and examination by the attending physician revealed grayish deposits on the iris and the capsule of the lens, with haziness of the cornea. Ophthalmoscopic examination was not attempted. This ocular complication appeared thirty-one days after confinement and ten days after the joint involvement. It grew worse rapidly and in four days the appearances were those of panophthalmitis. On the twelfth day the sclera ruptured and the patient was admitted to the wards of the University Hospital, where the eyeball was enucleated.

Examination of this patient failed to reveal the presence of cardiac or pulmonary lesions. There was no anemia, but a slight leucocytosis. Albumin was present in the urine, but no casts, and examination of the pelvic region by Dr. John G. Clark failed to give evidence of any residual puerperal infection, the pelvic floor being intact, the uterus normal and freely moveable, and no apparent disease of the ovaries or tubes. There were no changes in the joints discoverable, and the temperature did not rise above 99.5° F. Bacteriological examination of the purulent material in the interior of the globe showed the presence of staphylococci and numerous chains of streptococci.

Microscopically the conditions were those ordinarily seen in extensive panophthalmitis, namely, elaborate purulent infiltration of the chorioid, entire destruction of the retina, rich infiltration of the iris and ciliary bodies with mononuclear cells, and detachment of these bodies from the sclera, the cyst-like spaces thus left being filled with an albuminous exudate. The entire vitreous was converted into a purulent mass, the cells being polymorphonuclear and in a high state of degeneration. The sclera was also richly infiltrated, and in properly stained sections chains of streptococci were visible.

Dr. de Schweinitz, following Axenfeld's classification, described purulent metastatic ophthalmitis as it results from : (*a*) Puerperal pyemia; (*b*) surgical pyemia; (*c*) cryptogenetic septicopyemia; and (*d*) infectious diseases. In some respects the clinical features of the case which he recorded might be made to accord with any one of the first three of these groups, but he was inclined to think, on the whole, that it should be classified with the puerperal cases, and he pointed out that although pelvic examination had failed to reveal any residual puerperal infection, such infection was not excluded by this type of examination, because it was well known that there might be a small nidus in the uterine wall or mucous membrane from which the septic emboli could have proceeded, and that this would not give evidence of its presence on digital examination. The paper concluded with a review of the pathogenesis of metastatic ophthalmitis.

Discussion.—Dr. Pyle referred to a study of the literature relative to puerperal metastatic panophthalmitis made by him in 1901, which seemed to show that the affection generally appears between the fifth and fifteenth days after delivery, depending largely upon whether the metastasis follows infection through the lymphatics and blood-vessels near fresh wounds in the parturient tract, or through the open uterine sinuses, going directly into the circulation. Bilateral cases are almost invariably fatal, and it is quite likely that many such cases escape notice in the presence of bacterial thrombi in the internal viscera or brain, causing profound constitutional symptoms and speedy death. The desiderata in the miscroscopic study of these cases are:

1. To locate if possible the initial ocular lesion (generally in the retina). 2. To demonstrate septic emboli in the chorioidal or retinal blood-vessels. 3. To demonstrate the existence of micro-organisms in the eye. The general disorganization of the intraocular contents at the time of enucleation often prevents a satisfactory examination. Dr. Pyle referred to a case of monolateral metastatic panophthalmitis in a woman aged twenty-seven years, which occurred on the tenth day. A remarkable feature was the rupture of the sclera in the posterior segment, leaving a shrunken globe with the anterior segment, on first inspection, apparently unchanged. Such ruptures usually occur at or near the sclerocorneal junction.

Dr. de Schweinitz, concluding the discussion, stated that while it was true, as Dr. Pyle had said, that most of the cases of purulent metastatic ophthalmitis appeared within the first fifteen days, there were instances on record, as was evident from an examination of Axenfeld's tables, in which the ocular complications have been delayed as late as the seventh week. In surgical pyemia the disease might appear as early as the first and as late as the forty-fifth day. While bilateral purulent metastatic ophthalmitis was nearly always fatal, it was not invariably so, and several cases were on record in which recovery had occurred under these circumstances. Usually the eyeballs from cases of ophthalmitis came to examination at a time when it was not possible to determine the region first affected. Ophthalmoscopically emboli had been seen in the retinal vessels. Usually, if not always, in the bilateral cases, the narrowed capillaries of the retina first received these septic masses, but in the unilateral cases the uveal tract was the position at times of their primary lodgment. These facts were in accordance with the investigations of Axenfeld.

Nitric Acid Burn.

Dr. C. A. Veasey reported a case of Nitric Acid Burn Involving the Whole External Portion of the Eyeball in which the extensive employment of epithelial mucous grafts materially assisted in the recovery of useful vision. The patient, a chemist; had the misfortune to break a test-tube containing boiling nitric acid, the latter splashing in his face and affecting particularly his right eye. The condition received immediate attention at a hospital in the neighborhood and when examined one and one-half hours later there were found numerous burns on the cheeks, nose, eyelids and lips; and the whole ocular and palpebral conjunctiva of the right eye, with the exception of a small portion of the ocular conjunctiva ½ cm. in diameter up and out from the cornea, were so badly burned that the appearance was bluish white as if strong adrenalin had been employed. All visible vascularization had been destroyed. A piece of the broken glass had also made a wound one-quarter inch in length in the semilunar fold. The cornea was steamy, as if rubbed with grease, and through a loupe presented numerous long lines, probably scratches. Vision equaled L. P. The conjunctiva of the left eye was very red, probably caused by the fumes of the acid. Cold compresses, atropin, petrolatum and a light bandage were employed at first and as soon as the sloughing conjunctiva began to separate from the eyeball and lids hot compresses were substituted. One week after the accident, the outer fourth of the cornea was comparatively clear and sensitive, the remaining three-fourths hazy and anesthetic, the corresponding portion of the conjunctiva still blanched. Epithelial mucous grafts from the lower lip were now successfully employed to cover the denuded conjunctiva and became thoroughly incorporated with the exception of a small portion in the extreme upper and lower culs-de-sac. At a subsequent date a pseudo-pterygium was excised and the site covered with mucous grafts. Three months after the accident, with a correcting cylindrical lens, vision equaled 6/9, and there remained a small symblepharon above and another below, only observable upon everting the lids. The larger portion of the cornea remained hazy and anesthetic for five weeks; one week after beginning the administration of full doses of thyroid extract it had become much clearer and sensibility had returned. Whether this was simply a coincidence the author can not say, but since the same observation had been made by him in a case of neuroparalytic keratitis reported before the *American Ophthalmological Society,* in 1900, he considers the remedy at least worthy of trial in cases of greatly impaired corneal nutrition.

Discussion.—Dr. Risley referred to a burned eye that he had seen, following an explosion of a cannon cracker which presented the bluish-white appearance described by Dr. Veasey, with the exception of numerous powder grains in the eschar. The latter were readily separated from the eyeball with forceps and the patient made a rapid recovery. Subsequently, however, he became myopic though he had been previously hypermetropic, and he inquired as to the state of refraction before and after the accident in the case reported by Dr. Veasey. Dr. Risley also referred to a bad burn produced in one of his patients by the use of hydrochloric acid by mistake, instead of an ordinary eye lotion.

Dr. de Schweinitz thought Dr. Veasey's observations on the effect of thyroid extract in his patient and its influence, or apparent influence, on the clearing of the cornea of great interest. He had himself, when called in consultation by Dr. Veasey in the case already referred to, suggested the trial of this remedy, but whether the good result in that particular instance had been a coincidence or a result of the drug he could not say. He had not seen any other case in which it had been tried, but thought it worthy of further investigation. He had himself often employed the remedy at the suggestion of one of his medical colleagues in early and beginning lenticular opacities, and had never noted the slightest beneficial result.

Dr. Veasey stated, in conclusion, that he had never examined his patient's eye prior to the accident but the subsequent refraction was, for the burned eye, + S. 2 D. ⌢⌣ + C. 3 D. ax.

90°, and for the other eye + S. 12 D. ⊃ + C. .37 D. ax. 120° showing no myopia at this time. With subsequent contraction the axis of the cylinder was altered slightly, but the strength remained unchanged. Dr. Veasey also referred briefly to a burn he had recently observed when a patient had used spirits of turpentine in an eye cup in mistake for a boric acid lotion. Beyond a slight conjunctivitis, lasting three days, no harm was done.

C. A. Veasey, M. D.,
Clerk of Section.

IV.

Meeting, April 18, 1905. Dr. G. E. de Schweinitz, Chairman, presiding.

Dermoid Tumor of the Bulbar Conjunctiva.

Dr. S. D. Risley exhibited a case of small Dermoid Tumor of the Bulbar Conjunctiva of the left eye, situated near the fornix in the region of the ducts of the lacrimal gland. It was brought into view only by rotating the ball strongly downward and inward and holding the eyelid upward and outward. Several small very fine hairs were growing from its more prominent part and could be seen only in strong light or with a magnifying glass. He proposed to excise the growth. The only subjective symptom was the constant sensation as from a foreign body under the lid produced by the projecting hairs.

Transparent Lens Removed for High Myopia.

Dr. S. D. Risley also exhibited a patient, male, aged 22 years, from whose left eye the Transparent Lens had been Removed for High Myopia. Fourteen years before his parents had been told that that the child had atrophy of the optic nerves. Inspection revealed two very prominent eyes, suggesting exophthalmos. There was a large atrophic posterior stapyloma, surrounding both optic discs, but no apparent atrophy of nerves, and the fields of vision were normal. M. = 34. D. in each, and with correction V. = 5/60 uncertainly. The ophthalmometer showed very slight corneal astigmatism. A cautious discission of the capsule was made and later repeated with some laceration of the lens cortex. This was followed by swelling of the lens substance and the emergence of cloud like masses into the anterior chamber. After a week there was slight ciliary injection and some increased tension. The softened cortex was then evacuated by means of a keratome incision of the cornea, leaving only the grayish lens capsule and small masses of gray cortex entangled in its meshes. There was no reaction or pain.

A week later a central opening in the membrane was made with a knife needle leaving a clear black central pupil. A week after the needle operation with — S. 9. D. ⊃ — C. 1.00 D. ax. 90°, V. = 6/30+.

Discussion.—Dr. de Schweinitz, referring to Dr. Risley's first case, thought that it represented the so-called lipomatous dermoid of the conjunctiva, which is most frequently found between the superior and external rectus muscles, and which on section, after removal, shows the structure of the skin and of fatty tissue, and hence its name. He had removed a number of these growths, and referred to a paper which he had written on the subject for the Pathological Society.

Transparent Lens Removed for High Myopia.

Dr. Wendell Reber (by invitation) exhibited a patient from whose eye the Transparent Lens had been Removed for High Myopia. The patient, aged 40 years, had worn glasses from her eleventh year. In spite of careful refraction and general treatment M. increased. Vision six months ago, R. = 1/120, L. = 1/120; with glasses: R. — S. 26.00, D. = 5/60. L. — S. 24.00 D. = 5/30. The ophthalmometer showed astigmatism of 1.00 D. with the rule in O. D., and 1.75 D. with the rule in O. S. The radii of curvature of the corneas were R. 8 mm., L. 8. 10 mm. There were marked lenticular and vitreous opacities in the right eye, and a large posterior staphyloma and three large atrophic areas on the temporal side. In the left eye there was some slight vitreous haze, but not nearly so much fundus involvement. Notwithstanding careful treatment vision with the best glass she could be given (—24.00 D.)=5/60.

After consultation, Dr. H. F. Hansell did discission on the left eye, opening the capsule moderately. A week later freer incision into the capsule was made, inducing considerable reaction by the tenth day, when a suction operation was done. Rather a frank iritis followed, but after four weeks the eye quieted down and to-day (five months after operation) her vision, with a 4.00 D. Cyl. Axis 90° equals 5/15+. The right eye, because of the more extensive changes, was not operated upon.

Radial Tear in the Iris.

Dr. Edward A. Shumway exhibited a case which showed a Scar in the Cornea and a Radial Tear in the Iris, as the result of a perforating injury by the point of a fork eight years before. The lens was perfectly clear and the eye had a myopia of about 3 D. He thought that it represented a case in which a traumatic lenticular opacity had subsequently cleared, as it would seem impossible for a sharp instrument to penetrate the iris, without injuring the lens.

Subdivisions of the Visual Cortex With Remarks on Cortical Color Centers.

Dr. Charles K. Mills read a paper on Subdivisions of the Visual Cortex with Remarks on Cortical Color Centers, in which he stated that each primary or projection area of the cerebral cortex has its anatomically skirting and functionally correlated region of higher development. To Munk, Flechsig, Wilbrand, Campbell, Mott, and others we are especially indebted for our knowledge of these related physiological zones. The primary center for vision is that for the recognition of light, or the difference between lightness and darkness; all other cerebral visual centers are the results of evolution. The limits of the primary cortical visual center are the cuneus and the calcarine fissure. Form recognition has developed dorsally, toward and over the mesal edge of the hemisphere, expanding into the higher visual area, which is much subdivided into subareas and centers as into those for language symbols, geometric forms, designs, persons, places and natural objects. It is necessary to recognize a separate area for macular or clear vision, both in the primary and in the higher cortical visual area; the first is probably situated at the anterior extremity of the calcarine fissure, the second in and near the angular gyre.

Separate cortical centers exist for fundamental colors, these having developed ventrally. In all the cases of achromatopsia in which cortical lesions were present, as those of Brill, Verrey, Dejerine, and Henschen, the cortex of the lingual or fusiform lobule ventrad of the calcarine fissure was involved in the lesion. The stratification view of Wilbrand is not tenable. Cerebral development takes place by cortical expansion, not by the superimposition of strata and layers. The almost innumerable shades and tones of color capable of being appreciated by the human eye are to be explained by processes of association. The view that varying degrees of interference with conduction in the fibres of the visual pathway causes varying degrees of color blindness and of light recognition cannot be maintained. Extreme differentiation is the rule; of photo-chemical substances for the fundamental colors; of nerve end organs in the retina; of fibers or fibrils in the optic tract and optic radiations; of basal centers in the pregeniculum, and of cortical centers in the occipital lobe.

Discussion.—Dr. Spiller said he believed the cortical visual area is formed by the cuneus, lingual, and fusiform lobules, and occipital point, of which the calcarine cortex is the most important. It is difficult to determine whether the macular region is represented in the anterior or posterior part of the calcarine cortex, or in the whole of this cortex, and it is possible that each macula is represented in the calcarine cortex of both cerebral hemispheres. The case recently reported by Beevor and Collier (Brain, 1904) in which the calcarine cortex was destroyed, and yet the lower quadrants of the visual fields were preserved, shows that the visual area cannot be confined to the calcarine cortex. Dr. Spiller also said he was not prepared to accept the view that the posterior portions of the second and third temporal convolutions are part of the visual area. It may be that the recognition of form, persons, etc., is dependent upon the integrity of separate areas, although the evidence of this is not thoroughly convincing. The investigations of Hishelwood lend some support to the view. This investigator was led to believe that the letter and word visual images of each language a person has acquired are arranged separately within the center for word-seeing.

Conjunctival Irritation, Excited by Proximity to a Horse.

Dr. Wm. Campbell Posey read a paper on Conjunctival Irritation, Excited by Proximity to a Horse. He reported three cases in which irritation of the conjunctival and nasal mucous membrane was excited by the subjects coming in contact with a horse, or even going into the stable. One of the patients was a sufferer from hay fever. Irritation by dust in driving could be eliminated, as similar symptoms were excited in sleighing, and the patients were subject to no annoyance while automobiling. Dr. Posey recounted an observation which had been made in London, where the appearance of the symptoms was delayed for an hour by having a subject with this idiosyncrasy drive behind a horse which had been covered with vaselin. He said, further, that some individuals were susceptible to emanations from other animals, such as cats and elephants, and referred to an interview which he had had with Dr. S. Weir Mitchell, who had told him that he had seen marked cases of conjunctivitis set up by the presence of cats. The conjunctivitis, in the cases seen by Dr. Posey, took the form of swelling and injection of the conjunctiva, with a hypertrophy of the follicles, attended with a slight mucoid discharge. He concluded that the irritation of the conjunctiva in these cases could be attributed only to a peculiar individual susceptibility to the emanations from certain animals.

Discussion.—Dr. Pyle stated that in his work on "Anomalies and Curiosities of Medicine" he had made mention of similar instances which he had found in the literature of personal idiosyncrasy to the emanations from various animals.

Dr. de Schweinitz stated that he had one patient who always acquired a sharp conjunctivitis, more marked in one eye, if she went into the stable, but he had never known this patient to have a conjunctivitis from simply riding behind horses. He also had a patient with a remarkable idiosyncrasy toward cats. If, for example, she stroked a cat, she would in a very short time be seized with a sharp conjunctivitis, which manifested itself as follows: For a few minutes there were smarting, burning and hyperemia, followed by an intense chemosis, so great that the bulbar conjunctiva would protrude between the lids. This gradually subsided and the condition subsided in a few hours. The attack might be sharp or slight, according to the length of time of stroking the cat. If he were to compare the appearances with any others that were well known, he would say that they resembled an exaggerated dionin reaction, and thought it certainly must be explained by assuming an acute angioneurotic edema of the conjunctiva. Dr. de Schweinitz also referred to some experiments that had been made in order to determine what was the cause of the various conjunctival diseases which were caused by hairs, and made some reference to the chemical constituents which had been supposed to cause the conjunctivitis produced by the hairs of caterpillars and certain plants. He thought, however, that in the present instance these did not apply, as Dr. Posey's cases seem to have occurred without any local irritation by getting hairs into their conjunctival cul-de-sacs.

Dr. Posey, in conclusion, said that the literature contained many references to irritation of the mucous membrane of the respiratory passages by the emanations from animals, and that although in this class of cases it was thought to be due to an irritation of the olfactory nerves, it was impossible to state the precise nature of the exciting agent.

Mickulicz's Disease.

Dr. S. Lewis Ziegler presented A Case of Mickulicz's Disease showing bilateral lymphomata of the lacrimal, parotid and submaxillary glands, due to tonsillar hypertrophy, and consequent suboxidation. The enlarged glands were symmetrical, pale, and painless. The patient was a colored girl, somewhat anemic a confirmed mouth breather from greatly enlarged tonsils, and suffered from constant colds. He believed the etiology was suboxidation with subkatabolism. Excision of both tonsils, without any medication, brought complete resolution of the lymphomata extending over a period of about two months, the submaxillary glands yielding first, followed by shrinkage of the lacrimals and lastly of the parotids. The circulation, body heat, and general health showed equal improvement.

Discussion.—Dr. Posey said that when the intimate relationship which exists between the lymphatics of the eye and the glands in the neighborhood of that organ is considered, it is not remarkable that involvement of the lacrimal should be attended simultaneously with pathological changes in the parotid, submaxillary, and cervical glands, and in this connection, he wished to report that the case of Parinaud's conjunctivitis and inflammation of the conjunctiva, which was associated with marked changes in the glandular system of the head and neck, reported by Dr. Thomson at an earlier meeting of the Section, showed marked improvement in the ocular condition, though there was still some swelling in the preauricular and cervical glands.

He also referred to a negro girl that he had exhibited before the Section some years ago with bi-lateral hypertrophy of the lacrimal glands but without similar involvement of other glands of the body. The swelling of the lacrimal glands in this case subsided without special treatment in about 18 months' time.

Some Lesions of High Myopia.

Dr. H. F. Hansell read a paper on Some Lesions of High Myopia, Clinically Considered, in which he referred to the usual changes in the posterior portion of the eyeball resulting from increasing axial myopia and spoke particularly of the three symptoms which have their origin in the thinning of the chorioid and stretching of the retina in the neighborhood of the fovea, namely, slow vision, the demand for abundant illumination and the early exhaustion of the seeing power. He believed that the causes of progressing myopia are hereditary tendency to scleral distension, congenitally enlarged eyeball, excessive convergence, compression of the eyeball between the straight muscles and imperfectly corrected myopia and associated astigmatism, most of which causes are active in increasing the intraocular pressure in the posterior part of the eye. He did not believe that accommodation was a factor in the increase of myopia after the myopia had reached the degree of 8. D., excepting in those cases in which ciliary muscle contraction was forced by the constant wearing of full correction and that the attempt to re-establish functional relations between accommodation and convergence would result in failure.

Discussion.—Dr. Harlan believed that the chief factor in the production of excessive myopia is some disturbance of the relation of accommodation and convergence and that the proper relation should be established, if possible, by full correction.

Dr. de Schweinitz did not agree with Dr. Hansell in his recommendations in regard to the treatment of myopia with glasses. His personal experience entirely justified the assertion that the full correction is the object to be attained for young myopes with normal visual acuity and binocular near vision, no matter how high their myopia, provided the lens selected shall not be an over-correction when brought close to the eye. He believed that each case must be studied on its own merits, and there were exceptions to the rule just recited, for example, when visual acuity was very imperfect or binocular vision was lost; but all statistics at the present time which had been carefully considered ,indicated the great value of what is known as full correcion in the prevention of the increase of myopia.

Dr. Pyle spoke of a case of high myopia in a man of literary habits, aged 34 years, who wore with comfort a full correction of 11. D. Visual acuity was nearly normal, and there were no ophthalmoscopic evidences of the chorioidal and retinal changes commonly associated with high myopia, suggesting that the defect was not axial.

C. A. VEASEY M. D.,
Clerk of Section.

V.

Meeting, October 17, 1905. Dr. G. E. de Schweinitz, Chairman, presiding.

Spontaneous Dislocation of the Eyeball.

Dr. George C. Harlan exhibited a case of Spontaneous Dislocation of the Eyeball. The patient, a female, aged 44 years, presented a history of middle ear disease followed by left facial paralysis two years before. Nine weeks ago there was severe pain in back of head and neck, after which the eyes became more prominent. The exophthalmos was more marked in the left eye but there was no evidence of Basedow's disease. While lying in bed, without any exertion, the left eye began gradually to protrude until complete dislocation in front of the lids had been effected. It was reduced without difficulty, but as it recurred the lids were sutured. During examination of the other eye a few days later there was sudden dislocation when the lids were separated. This was also easily reduced. The eyegrounds were normal and no cause could be assigned.

Common Ocular Complications of Hysteria.

Dr. Edward A. Shumway reported five cases illustrating the more Common Ocular Complications of Hysteria. The first had repeated convulsions, paralysis and spastic contracture of the arm and leg, on one side, and compete hemianesthesia of the paralyzed side. The eyes had been blind during a period of stupor, and at the time of the examination vision was greatly reduced. There were true paresis of accommodation, unimproved by indifferent lenses, and contracted, tubular fields, with achromatopsia on the more affected side. The other four cases were of a milder type, in which the eye symptoms were comparatively more prominent. One, a child, aged 10 years, presented monocular paralysis of accommodation and mydriasis, with reduction of vision on the affected side. The dilatation came on after excitement and recovered completely after four months. The pupil contracted after eserin instillation, proving that no mydriatic had been used at home, and that the mydriasis was paralytic and not spastic. The fields were contracted, tubular, reversed for colors and there was an annular scotoma. The third case had unilateral mydriasis and paralysis of accommodation, following the extraction of an inflamed tooth. There was partial loss of vision on both sides, most marked on the side of the dilated pupil. Paralysis of accommodation was complete and the mydriasis was not overcome by eserin. The fields were normal. The fourth case showed bilateral reduction of vision, blepharospasm, convergence insufficiency, contracted tubular fields, with reversal for color. The amblyopia had remained unchanged for two years, and was the result of a fright. All four cases showed undue tenderness in the inguinal and inframammary regions, and, with the exception of the last, presented hemianesthesia of the side most affected in the eye examination. Careful examination of the nervous system was made in each case by competent neurologists. The fifth patient had reduction of vision in each eye with continual sensation of foreign body in the conjunctiva, as the result of a trolley accident one year previously. The fields were contracted and tubular, and the color-fields reversed. In none of the five cases were there any changes in the eye-grounds to account for the loss of vision. Three of the cases showed some tactile anesthesia of the cornea and conjunctiva. Dr. Shumway called attention to the fact that, while amblyopia was bilateral in all the cases, it was most marked on the affected side in each patient who showed hemianesthesia.

Discussion.—Dr. Harlan referred to a case of hysterical amaurosis with dilatation of the pupil immediately relieved by an application of Charcot's magnet, and in a subsequent attack by a wooden magnet simulating that of Charcot. Another case had been apparently blind since a blow from a snowball. The other eye becoming somewhat irritable, he had been advised by a physician to have the supposed blind eye removed. Various tests, however, showed that the patient could see well with the supposed blind eye, and he subsequently recovered his full visual acuity.

Dr. Risey described a case of a young woman in apparently excellent health for whom an iridectomy had been advised by her physician because of supposed blindness and dilatation of the pupil. Examination showed that the pupil contracted to light, that vision was present in each eye, that the visual field was contracted, together with reversal for colors, in the supposed blind eye. Under suggestion, the patient entirely recovered, but subsequently suffered a relapse while en route to her home in a distant city.

Dr. Carpenter had observed tubular fields, reduced vision, dilated pupils and nystagmus in an athletic young man. The patient recovered under general treatment and the nystagmus also disappeared. He also referred to another case of monocular blindness which at first had the appearance of hysteria, but which, in a week, presented typical retrobulbar neuritis. He particularly directed attention to the fact that occasionally cases of suspected hysteria were really those of beginning organic disease.

Dr. Pyle recalled a case of unilateral amblyopia, somewhat resembling hysteria and several times diagnosticated as such, in a patient affected with glycosuria. Complete recovery followed proper dietetic treatment.

Dr. de Schweinitz reported a case with the following symptoms: Complete unilateral left blindness, which had lasted for a year. The pupil reflex, however, was perfectly preserved. Visual acuity of the right eye was 6/20 and the visual field contracted to 20 degrees and typically tubular, the only color appreciated being red. All ordinary tests proved that the patient could see with the left or supposed blind eye; in other words, there was disappearance of monocular amaurosis during binocular fixation. With the right eye there was monocular diplopia, the images being side by side. The conjunctiva was anesthetic and there was hysterical aphonia.

In this connection Dr. de Schweinitz discussed the investigations of Cruchet on monocular amaurosis. According to him, the amaurosis should be considered in two stages: the first, in which there is complete abolition of monocular vision, and the second, more frequently observed than the other, in which there is intermittent and generally perverted conservation of binocular vision. The author maintains that, in cases of unilateral hysterical blindness, monocular vision exclusively by the good eye is the rule, but at certain moments and under certain conditions the monocular vision of the sound eye becomes monocular vision of the amblyopic eye—that is, there is alternation. Again, monocular vision may seem to become binocular, but only apparently so. Really it is simultaneous vision,—that is, fusion of the images does not take place. Again the monocular vision becomes binocular vision with the fusion of certain images and not of others—that is, the binocular vision, to use the expression of Antonelli, is dissociated. Finally, under certain other conditions, monocular vision really becomes binocular vision, with complete fusion of all of the images.

Dr. de Schweinitz agreed with Dr. Carpenter that occasionally apparent ocular manifestations of hysteria are really the representatives of organic disease, and that great care must be taken before a positive diagnosis is made. He had seen the case which Dr. Carpenter referred to, and had appreciated the difficulty of the diagnosis between retrobulbar neuritis and hysterical amaurosis. In this connection he referred to Bregmann's suggestion that just as retrobulbar neuritis may depend upon a primary disturbance of metabolism, so also may hysteria, the unknown toxin working, on the one hand, on the optic nerve, and, on the other, on the brain, and his belief that it is possible that the optic nerve disturbance may depend upon vaso-motor changes in the opticus. Hysterical edema is well known and therefore it is conceivable that an edema may arise in the optic nerve, which would bring about a condition of elevated pressure in the optic fibers, especially in the neighborhood of the optic foramen. He referred to the belief of some authors that some toxin is liberated during the hysterical attack, and that the retina is poisoned, or perhaps the cortical centers, by the toxin, which produces, according to its virulence, a temporary, and enduring, or a long-continued blindness, exactly as this occurs in uremia, in diabetes and in certain intestinal fermentations. Naturally, if this theory, which, as he pointed out, was only a theory, was admitted to be possible, it would be confessedly difficult to reconcile it with unilateral amblyopia, unless one were willing to admit a selective action of the toxin upon one retina, exactly as very rarely toxic blindness—for example, quinin blindness—is unilateral.

The difficulty of distiguishing between insular sclerosis and hysteria was referred to, and the fact that among the ocular signs of insular sclerosis nystagmus was at one time supposed to be characteristic of this disease and not to be present in hysterical cases. Dr. Carpenter's patient, however, an undoubted hysteric, had exhibited nystagmus, and a number of recent investigations indicate that nystagmus may be an ocular sign of hysteria, especially as it has been shown that it could be developed by suggestion and checked by the same means. So, too, the differential diagnostic point of a central scotoma is not a certain one, inasmuch as Parinaud and others have shown that a scotoma in the center of the field of vision exactly simulating that which is seen in toxic amblyopia and in insular sclerosis, occasionally appears in hysteria. Dr. de Schweinitz had studied a case of this character in the practice of Dr. A. G. Thomson.

Referring to the anomalies of the iris movements, or hysterical pupil phenomena, Dr. de Schweinitz thought that, according to the reported cases, they might be classified as follows: (1) Contraction of the pupil,—that is, either spasmodic or paralytic miosis; (2) dilatation of the pupil,—that is either spasmodic or paralytic mydriasis, the dilated pupil in one class of cases responding to light impulse, even if light perception is denied, and in another class of cases failing to contract under the influence of light impulse; (3) interchange of mydriasis and mirosis; (4) unilateral mydriasis, in one class of cases unassociated with paresis of accommodation, and in another class of cases associated with paresis of accommodation; (5) dilatation of the pupil with preserved but sluggish reaction to light and paralysis of accommodation.

At one time neurologists maintained that a differential diagnosis between epileptic and hysteric seizures could be made by observing the pupils, which in the former were wide and reactionless, while in the latter reaction was preserved. The investigation of Karplus, however, shows that pupil immobility may occur during hysterical attacks, and that it probably is a frequent phenomenon in paroxysmal hysteria, depending, in all likelihood, upon a cortical origin, and that, therefore, the pupil signs alone are not sufficient to make a differential diagnosis between these two states.

Dr. Shumway, in concluding, gave especial emphasis to the employment of eserin to determine whether hysterical mydriasis was paralytic or spastic.

Disease of the Bulbar Conjunctiva.

Dr. S. D. Risley presented the history of a case of Disease of the Bulbar Conjunctiva, presumably tubercular in character following severe injury from a blast in the coal mines received in March, 1905. He was first seen by Dr. Risley on July 5th. The cornea of both eyes exhibited numerous scars at the site of injuries by small foreign bodies; there was severe pain and photophobia, much thickening of both bulbar and tarsal conjunctiva and a muco-purulent discharge. He was treated as an out-patient without relief until August 15th. Numerous almond-shaped nodules had then formed under or in the bulbar conjunctiva of both eyes extending well back into the fornix. There was some enlargement of a few cervical glands and clubbed finger ends, but no other physical signs of general disease, and the family history was good. The man was admitted to the Wills Hospital, and for a few days his temperature, respiration, and pulse carefully noted without revealing any abnormal variation. He then, August 18th, received in the tissues of the arm, 2 *m.* of Mulford's tuberculin, which was followed in thirty-six hours by pronounced general and local reaction. After the subsidence of the symptoms the eye conditions improved until September 7th when a second injection of 2 *m.* was given with similar result, and still more marked and rapid improvement in the eyes until September 13th, when the man boasted that he could open his eyes and could see the time on the ward clock. Five injections, in all, were given, the last three with diminishing reaction until no symptoms followed the last of 3 *m.* on October 10th. The nodules had then disappeared, the eyes being quite well. The general health had improved and the man was discharged from the hospital on October 18.

C. A. Veasey, M. D.,
Clerk of Section.

VI.

Meeting, November 21, 1905. Dr. G. E. de Schweinitz, Chairman, presiding.

Concerning the Pathway of Certain Post-Operative Infections.

Dr. G. E. de Schweinitz and Dr. C. M. Hosmer (by invitation) reported the results of microscopic examination of an eyeball which had been removed on account of iridocyclitis following cataract extraction, the infection having first appeared on the fourteenth day after the operation. For eight days following the extraction there was no sign of trouble, the wound being closed and the eye in excellent condition. On the afternoon of this day the wound reopened without traumatism, was closed on the following day, and for five days the eye gave no sign of abnormality in the healing process. Then, after severe pain, slight infiltration of the lips of the wound appeared, associated with marked iridocyclitis. In spite of the most vigorous treatment, at first followed by good results, but later by violent relapse, the inflammation continued, and about a month later the eyeball was enucleated.

Microscopic investigation revealed the lesions of intense iridocyclitis, with dense infiltration of the ciliary body and iris with round cells. In a position posterior to the iris and proceeding from a small fragment of retained cortex, a fillet of lens capsule could be traced all the way across the chamber into the wound and up to its very margin. The fillet was surrounded by a mantle of small, deeply stained round cells, and evidently had acted as a drain or pathway along which the infecting material had proceeded. The patient had had lacrimal obstruction, but prior to the operation this had been entirely or apparently entirely relieved by suitable treatment. The authors discussed the subject from the standpoint of their own investigations, and those of others, particularly Wangenmann's examinations of the causes of late infection by filtration through permeable operation scars, or imperfectly closed operation wounds. Incidentally they also discussed the various methods of opening the capsule and avoiding the inclusion of particles of capsule or cortex in operation wounds.

Discussion.—Dr. Posey called attention to the fact that prolapse of part of the capsule into the lips of the wound had other dangerous qualities, and recalled Treacher Collins' observations of glaucoma following operation, where a portion of the capsule was found entangled in the wound and the angle of the anterior chamber closed by the traction made by the strand of capsule. Dr. Shumway stated that Hirschberg reported good results in late infection from cauterization and removal of the exudation from the anterior chamber. Dr. Ziegler did not think cauterization was indicated at the first rupture of the wound unless the infection was evident and continuous from the regurgitating tear duct. He thought that capsular filaments were more often incarcerated in the corneal wound after discission than after cataract extraction. While he made a V-shaped incision in secondary capsulotomy, he preferred in primary cataract an incision resembling the Greek letter pi, consisting of a vertical incision on either side of the pupillary area, connected on the top by a horizontal incision, a very sharp cystitome being used. The flap thus made falls down to the bottom of the anterior chamber, and so frees the wound of capsular shreds. Dr. Sweet cited a case of infection occurring twenty hours after iridectomy for acute glaucoma which followed needling of capsular cataract eight days previously. At the time of the discission preliminary iridectomy was performed on the other eye. He believed that the infection was due to the germs which gained access to the anterior chamber through the corneal wound after the discission. Dr. Hansell believed that in late infections the possibility of the trouble arising from other organs should not be forgotten. Several years ago he reported a case of panophthalmitis, which was clearly traceable to purulent cystitis. Dr. Risley thought that the subject of auto-infection worthy of serious consideration. In a case of failure of the incision for cataract to heal, he found a shred of capsule in the wound which was cut off, and healing promptly followed. If a broad conjunctival flap is made, the rapidity with which the wound closes might neutralize the effect of a small shred of capsule caught in the wound.

In concluding the discussion Dr. de Schweinitz said that in the treatment of the patient, which he had not given in detail, all of the approved methods, including cauterization of the wound had been tried. On the day on which the wound had opened, and before any of the symptoms of infection had appeared, there had not seemed to be any reason for cauterization, as such an accident was not an uncommon one after cataract extraction. He doubted, however, if it would have made any difference in the ultimate result of the case had the wound been cauterized immediately after the chamber opened. He agreed with Dr. Hansell that occasionally infection might come from other sources than those immediately surrounding the eye, or in other words, be derived from the body generally, but thought that all investigation showed that in the majority of cases porosity of the operation wound through which the infecting material leaked accounted for these late infections.

Ocular Injuries from Glass and Stone.

Dr. William M. Sweet reported one case of glass in the ciliary region, and one case of three small pieces of stone in the lens. In both instances the situation of the foreign bodies was located by the X-rays, and the particles removed by forceps in the first case and by a lens scoop in the second. Experiments were made to show the resistance of such substances as glass, stone, cement paving and anthracite coal to the passage of the rays. Particles of these materials were placed on a half-inch board and exposed to the rays. With the exception of coal, the various materials gave shadows upon the plate of about equal density. The shadow of anthracite coal was so faint as to preclude localization of this substance if in the eyeball. Additional experiments were made with small pieces of glass placed at the inner canthus of the cocainized conjunctiva, and the rays passed through the nose and eyeball. In every instance a shadow of the glass was secured on the plate at the side of the head if the exposure was not too prolonged, and the tube was placed to shadow the body free from the dense portions of the orbital walls. He believed that, while it was not possible in an individual case to positively state that the eyeball did not contain a particle of the glass or stone inflicting the injury, in many instances a shadow of the substance could be shown on the plate if several sets of radiographs were made, in the attempt to shadow the anterior segment of the globe in front of the dense bones at the external orbital margin or of other portions of the eye through the thin bone forming part of the external wall of the orbit. As the distance of the orbital margin back of the center of the cornea varies in different individuals, amounting to as much as 20 mm. in some cases, it will often be possible to secure a shadow of the entire anterior half of the eyeball free from the dense bony shadow of the external wall.

Chancre of the Eyelid with Interstitial Keratitis.

Dr. John T. Carpenter reported the history of a man aged 27, who had chancre on the left lower lid on June 1, 1905, which was mistaken by his physician for an abscess of the lacrimal sac and freely incised at the inner canthus. When seen by Dr. Carpenter on July 19th, the development of an ulcerated area covered with gray membrane on the lower lid with sharply defined rim beyond which was an area of induration, together with swelling of the sub-maxillary and pre-auricular lymphatics, led to the diagnosis of chancre of the lid, which was confirmed by the early appearance of marked secondaries. The infection followed some saliva coughed into the eye by a friend who was known to be suffering from extensive mucous patches and chancre. This was followed in two weeks by irritation with swelling at the inner canthus. Under mercurial inunctions rapid and continued improvement resulted in complete cure with very little loss of tissue. A still more interesting complication was the development of interstitial keratitis about five months after the chancre had made its appearance. The question of the diagnosis of chancre of the eyelid was discussed at length and the importance of the induration and associated lymphatic involvement was emphasized. The differential diagnosis must be made between hordeolum or chalazion at the inner canthus associated with great swelling of lids; lacrimal abscess; syphilitic ulcers or broken down gummata; chancroid; lupus; tuberculosis and epithelioma. The clinical history of this case shows, in his opinion, the necessity of including interstitial keratitis among the lesions of acquired syphilis.

Reference was made to the five cases reported by E. Treacher Collins in which chancre of the eyelid was followed by interstitial keratitis affecting the eye which had been the seat of the primary sore. In all of these cases, as in the present instance, the opposite eye had escaped the corneal involvement.

Discussion.—Dr. Posey was inclined to think that secondary and tertiary ulcers were scarcely less uncommon than the primary sore. He recalled a case of syphilitic ulcer of the eyelid, which he had presented before the Section in 1901. In this case, the ulcer had involved the outer half of the lower lid and had entirely destroyed the margin of the lid. He said that these ulcers may be preceded either by a gummatous infiltration of the lid, which may resemble a stye, or the initial process may take the form of small prominences, like chalazia.

Dr. de Schweinitz, discussing Dr. Carpenter's paper, said that on two other occasions he had seen a chancre of the eyelid. One had occurred in the Philadelphia Hospital, the chancre occupying the inner portion of the lower lid of the left eye and extending to the bulbar conjunctiva. Unfortunately, the patient eloped early in the treatment of the case, and the subsequent history of the case was absolutely unknown, and therefore he was unable to say whether, as in Dr. Carpenter's case, any involvement of the cornea had followed. The second case he saw only once in consultation with another doctor, and believed that the lesion was a primary syphilitc sore, only because he had been informed that it rapidly yielded to mercurial treatment. The subsequent history of this case he was also unable to give, and also unable to state with positiveness that the ulcer should be classified as a primary sore, because sometimes, as Dr. Harlan had shown, syphilitic ulcers occurred upon the eyelids, probably as the result of brokendown gummas, which naturally would disappear under anti-syphilitic treatment.

Dr. Risley had seen in his experience only one case of primary chancre of the eyelid, and was unable to recall a single case of interstitial keratitis that could be with certainty traced to acquired syphilis. He thought it was difficult or impossible to prove that in subjects of acquired syphilis there was not also hereditary syphilis. Instances of unilateral interstitial keratitis were rare. It should be remembered that many years may elapse before the other eye is affected. Dr. Zentmayer referred to a case in the clinic of the late Dr. Norris, in which there was no glandular swelling, although the ulcerated growth on the lid ultimately proved to be a chancre.

Triangular Opacities in the Superficial Layers of the Cornea.

Dr. Wm. Campbell Posey showed two cases of Triangular Opacity in the Superficial Layers of the Cornea, occurring in syphilitic subjects. The first case occurred in a lad of 17, the subject of congenital syphilis, and developed during the course of an ordinary interstitial keratitis. The second case was that of a colored woman with specific uveitis and secondary glaucoma. The opacity occupied the lower portion of the cornea in each instance, with its apex near the pupillary centre and its base at the limbus of the cornea. When viewed under a high magnifying power, the opacity was found to reside in the epithelial and sub-epithelial tissues, being sharply defined from the rest of the cornea by a somewhat elevated ridge of demarcation. These triangular areas were avascular, and seemed to be made up of proliferated epithelial cells which had undergone calcareous change.

Dr. Posey said that not very dissimilar changes in constitution, though differing in form, have been remarked in the superficial structures of the cornea in other parenchymatous affections of that membrane, as, for instance, in keratitis disciformis and ribbon-shaped keratitis; and he thought that the opacities in the cases just reported by him might be explained, as in these latter instances, by a change wrought upon the epithelial and sub-epithelial cells by the fluids of the inflamed uvea in general, but particularly of the substantia propria of the cornea itself. He surmised that the triangular form of the opacity could probably be accounted for by some peculiarity in the circulation of the cornea, either vascular or lymphatic. He pointed out that it is a matter of clinical experience that in many cases of commencing keratitis the cornea frequently becomes infiltrated in localized areas, and recalled the fact that von Michel attributed the localization in these opacities to a syphilitic affection of the marginal loop of blood-vessels.

Tubercular Keratitis.

Dr. Posey presented, also, a case of supposed Tubercular Keratitis, occurring in a colored boy. The keratitis took the form of an infiltration of the interstitial lamellae of the cornea of one eye, with a number of yellowish-white oval areas, which were separated from one another by clear corneal tissue. The case had been under observation for three weeks, and, although the ciliary injection and other signs of marked uveitis which were present when at first seen had subsided, the corneal condition had remained practically unchanged. He proposed using tuberculin, for diagnostic as well as therapeutic purposes.

A Case of Buphthalmos.

Dr. Posey presented, also, A Case of Buphthalmos, occurring in the right eye of a girl 11 years old; the condition had dated from birth. The diameter of the cornea was 17 mm. The lens had been dislocated, and could be seen lying back of the iris below, having undergone calcareous change. There was a deep excavation in the head of the nerve, with marked signs of degeneration in the chorioid and retina.

Dendritic and Interstitial Keratitis.

Dr. E. A. Shumway demonstrated: (1) A case of Dendritic Keratitis associated with malaria, in which the malarial organisms had been found in the blood. There was marked cyclitis, and the corneal ulceration had existed for three months. (2) A case of Interstitial Keratitis Due to Acquired Syphilis.

Discussion.—Dr. de Schweinitz, discussing the cases of interstitial keratitis exhibited by Drs. Shumway and Posey, referred to the fact that the interstitial keratitis of acquired syphilis was more frequent than had once been supposed to be the case. His experience agreed with that of those observers who in recent times had shown that this disease was usually a late secondary or a tertiary event. It may be circumscribed or diffuse, and was more apt to be unilateral than the variety due to inherited syphilis. Its evolution was relatively more rapid, and it was more promptly amenable to treatment. He referred to a number of cases that he had seen develop as an undoubted manifestation of inherited syphilis, all of whom had been adults between the twentieth and fiftieth year of life.

Membranous Occlusion of the Pupil.

Dr. S. Lewis Ziegler exhibited two cases following cataract extraction, seen by him at the Wills' Hospital, in which he had successfully preformed his operation of V-shaped iridotomy. The operation was performed with a modified Hays' knife-needle, puncture being made at the upper margin of the cornea, and the point of the knife carried to the lower part of the interior chamber and swung 2 mm. to the left of the vertical meridian. Counter puncture was made in the iris membrane, and the incision carried up through the membrane to the point of entrance. As this opened up to an oval the knife was swung up through the opening and again passed across the anterior chamber to a point 3 mm. to the right of the vertical meridian. Counter puncture was again made in the iris and the incision carried up to meet the first at the apex of the triangle. The traction of the tissues caused the flap to recede making a triangular pupillary opening.

The advantages of this operation are the absence of traction on the ciliary body, the avoidance of opening the anterior chamber, especially in cases of fluid vitreous, and the ease of manipulation. The possible causes of failure are premature escape of aqueous humor, allowing the tension to drop, excess of knife pressure made by the operator, and failure of the membrane to retract owing to its great stiffness. In the latter case an incision can be made through the cornea below and the stiffened flap drawn through and cut off with iris scissors.

The resultant vision in one of these cases was $^{20}/_{40}$ and in the other $^{20}/_{20}$.

Leuco-Sarcoma of the Chorioid and Ciliary Body.

Dr. G. E. de Schweinitz, and Dr. C. M. Hosmer (by invitation), gave the results of the examination of the eyeball of the patient, a man aged 57, which had been removed on account of a sarcoma, that was found to spring from the chorioid far forward, arising in the layer of the larger blood vessels, and to involve the ciliary body as far as the root of the iris. Pigment was entirely wanting and the growth was therefore a leuco-sarcoma. It was of the mixed cell type, most of the cells being of the small round variety. A few were distinctly spindle-shaped, and in places there were alveolar spaces containing large round and oval cells. Prior to enucleation, ophthalmoscopic examination had revealed not only a detached retina, beneath which lay the sarcoma, but in the macular region an elevation presenting the characters of an exudate, covered on its surface by collections of irregularly shaped black masses, somewhat resembling pigment cells. Microscopic investigation proved that this elevation was composed entirely of an albuminoid material, which lay between the chorioid and the retina and that the black, cell-like bodies which had been seen with the ophthalmoscope consisted of collections of the retinal pigmented epithelium. Thus far there had been no sign of a recurrence of the growth, eight months after the removal of the eyeball.

A Case of Double Persistent Hyaloid Canal.

In reporting this case, Dr. H. F. Hansell stated that in the majority of cases a string-like tissue is seen through the ophthalmoscope running from the retinal artery on the papilla in the axis of the vitreous to the posterior surface of the lens, dark or gray in color, sometimes containing blood, more frequently not, and slightly changing form with every movement of the eye. It may be complete as in this patient's left eye, or partial as in his right eye. In both eyes it is attached at one place only and that the lower nasal quadrant of each lens. Usually it terminates by a number of small branches at or near the posterior pole. A peculiarity that I have never seen except in this case is that on the right side no trace of its posterior extremity can be found. In most instances preservation of the canal is only a part of extensive pathologic changes, such as vitreous opacities, dislocated lens, patches of atrophied chorioid, retinitis pigmentosa, coloboma of the lens or uveal coat, connective tissue changes in the interior of the eye and micophthalmos. In speaking of the diagnosis of true hyaloid artery from Cloquet's canal, von Hippel says (Graefe and Saemisch, second edition): "A large number of cases have been described in which it appears to me the diagnosis was not justified. Among them are those cases in which a vessel runs out from the papilla a short distance into the vitreous and then turns on itself to be continued on the retina as an artery or to disappear into the papilla. The returning part often winds itself about the outgoing part. That the latter partakes of the character of a vein has not as yet been proven. The origin and significance of this tortuosity have not been explained. The normal arteria hyaloidea never shows such a course and a vena hyaloidea is unknown."

The Symptoms of Ametropia.

Dr. Howard F. Hansell called attention to the difficulties in the way of determining the value of corrections of optical defects in the cure of the manifold reflexes attributed to ametropia. Are the reflex symptoms under consideration in any given case due to eyestrain; is the coincidental disappearance of extraordinary reflexes due to wearing glasses; are the symptoms dependent upon errors of refraction or upon loss of muscular equilibrium, are questions that can only be answered after careful study of each individual case and cannot be prognosticated. The controversy between ophthalmologists and neurologists is unfortunate and arises in part at least because the so-called functional diseases of the nervous system are seldom seen by the oculist in their early stages but only after they have become confirmed and have lost their functional character. It is a mistake for clinical writers to publish only their successes. The record of failures would be equally valuable. The expression of eyestrain assumes many forms, controlled or modified by the impressionability of the higher centers and the degree of responsiveness of the muscular and vascular systems. The situation of the reflex and its character are individual and may be ascribed to inherited or acquired personality. Astigmatism in one individual gives rise to headache, in another to facial chorea, and in another to vertigo, according, not to the degree or axis or kind of astigmatism but to individual characteristics which in turn are dependent upon heredity or environment.

Discussion.—Dr. de Schweinitz agreed with the views which Dr. Hansell had announced. He believed that it was unquestionably true that fully 60 per cent. of functional headaches depended upon anomalies of refraction, accommodation and motility of the eyes, and that the interpretation of eye-strain included many symptoms not necessarily suggesting that the eyes themselves were at fault, for example, all manner of headaches and vague pains, vertigo, nausea, pseudo- and habit-chorea, neurasthenia, hysteria, so-called gastric troubles, tachycardia, indigestion, night-terrors, etc. He depreciated, however, the tendency in some quarters to exaggerate the subject. Such exaggeration was apt to lead to distrust among general practitioners and cause them to fail to bring to proper eye examination the very cases that required it. He insisted on the necessity of examining for and finding the smallest degrees of astigmatism, and providing suitable lenses in all of these cases, but also insisted that this should in no sense lead to neglect of general examination and a search for other probable causes of the so-called reflex symptoms. He referred to the ease with which symptoms might be suggested to nervous and neurasthenic patients, and to the danger of over-enthusiastic practitioners attributing to ametropia *all* cases of so-called reflex phenomena, because sometimes in individual instances cure had followed the adjustment of glasses. He agreed most thoroughly with Dr. Hansell that the most painstaking investigation of ametropia, and of muscular imbalance should always be made, but never to the exclusion of general examination and the investigation of other organs from the anomalies of which these symptoms not only might arise, but often did arise. It was only by such thorough investigation that the best therapeutic results could be obtained. Dr. Pyle considered it the duty of the ophthalmologist to exhaust every means at his command to discover if possible an ocular element in the cases referred to him. Without such mental attitude and proper faith in his work, the important finer errors of astigmatism might escape detection. He thought that the specialist in ophthalmic work should take every opportunity to call the attention of the general profession to the beneficient results of the proper correction of ametropia. He failed to see what possible harm could follow legitimate emphasis of such claims. Dr. Turner believed that prolonged rest and not glasses was often the treatment required. Dr. Carpenter cited a case of epistaxis relieved by glasses, and which recurred when the lenses were broken and not worn for several days, to show how preposterous it would be to claim that glasses should be employed to cure epistaxis.

Acute Retrobulbar Neuritis Probably Due to Sinusitis.

Dr. William Zentmayer gave the history of a colored female aged 27 years, single, cook, in whom vision began to fail four days previously, accompanied by severe retrobulbar pain and left-sided headache. She gave a history of two attacks of inflammatory rheumatism. Vision—fingers at 18 inches. Pupil partially dilated and scarcely responsive to light. Small candle field extending outwardly from temporal side of fixation. In the affected eye there was enormous distention of the retinal veins with intense striation of the retina. In the other eye the veins were slightly enlarged. Physical examination negative. Nasal examination showed frontal and fronto-ethmoidal sinusitis. Rapid subsidence of pain and venous engorgement under intranasal treatment and the internal use of atropin and iodides. Six weeks later, eye blind and disc white.

William M. Sweet,
Acting Clerk of Section.

VII.

Meeting, December 19, 1905, Dr. G. E. de Schweinitz, Chairman, presiding.

Keratitis Disciformis.

Dr. Wm. Campbell Posey presented a second case of Keratitis Disciformis. The patient, a stone mason, aged 34 years, had been struck in the right eye a month previously. Moderate inflammatory symptoms followed. A disc-like opacity with small prolongation to the temporal side persisted. This opacity was grayish white, quite superficial, and was composed apparently of a series of small dried-up vesicles. The parenchyma of the cornea was clear. The edges of the disc upon the cornea were sharply outlined and with the center were denser than the remaining portion. The eye was free from inflammation. Massage with an ointment of bichlorid of mercury in strengths varying from 1-5000 to 1-200 made no effect upon the opacity.

The writer pointed out that this case, in common with the case presented by him before the Section in January last, showed all the characteristics of keratitis disciformis as noted by Fuchs with the exception of the superficial position of the opacities. He thought, however, that the cases when they were observed by him had arrived at the final stage of the process and considered it likely that during the acute stages the parenchyma of the cornea had been affected. He referred to a recent paper by Schirmer, which showed the connection between keratitis disciformis and the affection of the cornea which arose after infection of that membrane by vaccine virus. Recent observations by Meller upon the pathology of the disease were also dwelt upon. This author had found in an enucleated eye, the seat of keratitis disciformis, an infiltrated area in the center of the cornea, which extended anteriorly and posteriorly to Bowman's and Descemet's membranes respectively. The epithelium was infiltrated with free round cells and was lifted up in places, being reduced to several layers only. Bowman's membrane was normal but Descemet's membrane was thrown into numerous folds and there was a thick exudation of fibrin adherent to it posteriorly, which took the form of a disc.

Showing the connection between keratitis disciformis and corneal erosions, of which mention had already been made by Peters, the writer presented a Case of Relapsing Keratitis, in which the opacity, though hour-glass in form, presented many characteristics in common with the disc of disciform keratitis.

Cyst of the Iris.

Drs. G. E. de Schweinitz and E. A. Shumway, reported a case of Cyst of the Iris. In December, 1904, the patient, a girl aged five years, was struck on the left cornea with a piece of corset spring. The inflammation subsided, and when the child was examined in the University Hospital ten months later, the right eye was normal. Just above the horizontal meridian at its inner end in the left eye there was a small corneal scar, to the posterior portion of which the iris was attached by a delicate, slender synechia. Within the pupil space the remnants of some lens tissue were visible, together with a slightly opaque lens-capsule. The pupil was nearly round and freely movable. The fundus was normal.

The child was not again seen until December 3, 1905, when she returned because of some pain in the right eye occasioned by studying, and a change in the appearance of the left eye. After correcting the refractive error, vision became normal and the discomfort ceased, but the following changes were noted in the left eye: Exactly replacing the synechia previously described, there is a cyst, which extends from the surface of the iris to the posterior part of the cornea. Its upper two-thirds is formed of a delicate, translucent wall, while its lower third is pigmented and composed of a collar of iris-tissue, slightly fringed on its edge. The apparent size of the cyst is that of a small elongated shot. There is no tenderness and ciliary congestion; the eye in other respects exhibiting no changes other than those already noted.

The authors referred to the classification of iris cysts. As will be remembered, Hulke nearly forty years ago gathered iris cysts in four groups: (1) Delicate membranous cysts with an epithelial lining and clear, limpid contents. (2) Thick-walled cysts, with opaque thicker contents. (3) Solid cystic collections of epithelium, wens, or dermoid cysts. (4) Cysts formed by deliquescence, or myxomata. Richard Greeff considers this old classification to be a suitable one, provided Classes 1 and 2 are described as "true cysts," and Classes 3 and 4 as "false cysts."

Ginsberg is satisfied with the following: (1) Lymph-retention cysts, and (2) implantation cysts, which include traumatic, serous cysts and atheromatous cysts.

J. Herbert Parsons suggests this classification: (1) Implantation cysts, including pearl and atheromatous cysts; (2) retention cysts; (3) congenital cysts; (4) cysts of the retinal epithelium; and (5) parasitic cysts.

Referring especially to their case, it was thought that it probably belonged to the implantation cysts, of that variety often described as a traumatic serous cyst, and which arises because corneo-conjunctival epithelium gains entrance through a corneal wound, proliferates and develops a cyst. The epithelium of the cyst may be connected with the corneal epithelium, and invaginated along the line of the original perforating wound, or may be derived from a particle of corneal epithelium which has been implanted.

Based upon microscopic evidence, Lagrange suggests that instead of describing serous cysts as spontaneous and traumatic, they should be divided into epiblastic and mesoblastic cysts. Thus, an epiblastic cyst could arise from the traumatic inclusion of a particle of epithelium in the anterior chamber, or from a congenital ectodermic inclusion. But a mesoblastic cyst could arise from a traumatism, an anterior synechia, an inflammation, or from an effusion of blood in the iris. It would be characterized by an *endothelial,* not epithelial, lining of its walls, the structure of which would be composed exclusively of mesoblastic tissue.

Streiff believes that true serous cysts on the anterior surface of the iris arise beneath the "cryptal layer" (Kryptenblatt), either as *endothelial* cysts by shutting off the lymph-spaces, or after traumatic separation of a part of Fuchs' iris cleft (retention cysts, cleavage cysts), or as *epithelial* cysts by congenital or traumatic misplacement of epithelium into this cleft (congenital epithelial implantation and invagination cysts).

Finally, from the standpoint of their position, these cysts may be divided, according to J. Meller, into *iris-cysts proper* which are situated entirely within the iris tissue, *iris-chamber cysts*, which are situated partly in the iris and partly in the anterior chamber, and *wall-chamber cysts* which are so situated that the iris forms only part of their boundary wall.

Discussion.—Dr. Harlan referred to a case of cyst of the iris he had observed which was found to be due to the implantation of a cilium. Dr. S. D. Risley exhibited a drawing of an iris cyst that he had previously reported.

Secondary Glaucoma.

Dr. G. E. de Schweinitz demonstrated a patient with Old Corneal Changes Following Injury and Secondary Glaucoma. The right cornea showed the following lesions, which had followed a blow upon the eye with a piece of rope, three years prior to his examination: The upper third of the cornea was delicately frosted in its superficial layers. Succeeding this there was a crescent of old infiltration passing from one margin of the cornea to the other, about two mm. in width, and composed of a series of oval and circular opacities shaped somewhat like the links of a chain, the center of each exhibiting a small clear space. Below this arc there was a less delicate haze in the cornea than that which the upper third exhibited, through which could be seen a fine arrangement of lines, forming a series of acute angles, the so-called geometrical figure. The iris was slightly tremulous, the pupil widely dilated and the tension elevated.

Vision was reduced to light perception, and this was present only on the temporal side of the field. The haze in the cornea was evidently explained by the result of the injury, and the geometrical lines by infiltrations, either in the deeper layers of the cornea, or in Descemet's membrane. It was thought that the crescent of chain-shaped infiltration might have represented the ultimate results of a bullous keratitis of unusual distribution, as there was a history of frequent attacks of redness and foreign body sensation in this eye during the past three years.

Dr. de Schweinitz discussed the pathology of vesicle formation after injury, and the various theories which have attributed this condition to local degeneration of the cells on account of continued irritation of the epithelium; to neuritis of the corneal nerves and to change in the form of the basal corneal epithelial cells. He also discussed the theories of the increased fluid in the cornea in edema due to glaucoma, referring to the views of various authors that it may be explained by a pure stasis of lymph circulation, by the passage of fluid from the anterior chamber into the cornea, owing to permeability of the endothelial cells under pathological conditions, and to the possibility that fluid may also come from the capillary network of the corneal limbus.

Discussion.—Dr. Harlan referred to an article by Villard, in a recent number of the Annales d'Oculistique, on traumatic glaucoma, in which that author states that the affection is rather rare. He has been able to find only 24 cases recorded. The pathogeny is not determined. Some authors think that the increased tension is of nervous origin; others, basing their opinion on the albumin theory, suppose that the aqueous humor is charged with a large proportion of albumin which transudes through the walls of the vessels of the ciliary body paralyzed by the traumatism, and obstructs excretion. Others maintain that the angle of filtration is obstructed by swelling of the ciliary body. In certain cases intraocular hemorrhage or subluxation of the lens may be an important factor.

Monocular Blindness Occasioned by Visible Spasm of the Central Artery of the Retina.

Dr. D. Forest Harbridge (by invitation) reported a case of Monocular Blindness Occasioned by Visible Spasm of the Central Artery of the Retina. The patient, a male, aged forty-nine years, complained of frequent attacks of absolute blindness in the left eye, lasting from one to five minutes, and at first occurring at two-hour intervals, later becoming more frequent. The attacks began by slight supraorbital pains shortly followed by loss of vision, the nasal field always disappearing first. The attacks were usually started by the patient assuming a bending posture and were followed by supraorbital pain and ocular tenderness. Vision of O. D. equaled 6-9 : O.S., 6-6. Ophthalmoscopic examination practically normal; no evidence of arterio-sclerosis. Attacks were frequently observed and began with dilatations of the pupil. The inferior temporal artery gradually became lessened in calibre until completely collapsed, followed by the inferior nasal and superior arteries. A similar condition followed in the veins, the nerve became quite pallid and the retina slightly hazy. After about four minutes' duration the normal fundus condition gradually returned, normal visual acuity appearing a little later.

The patient had been subject to vertigo and attacks of migrain, had been twice injured, and there was complete loss of sexual power; probable specific history. Medical examination was practically negative; the neurological examination was suggestive of beginning tabes.

Discussion.—Dr. Posey recalled some cases of transient monocular blindness reported by him some time before, but he had not seen any of them during an attack. Since the published report, two of the patients had died from vascular changes. He thought the prognosis should be guarded. If the patient did not lose vision because of the spasm it was likely that a thrombus would be formed later. He advised iridectomy if the attacks could not be controlled by other means. Dr. Zentmayer had seen the patient during two attacks. In the second some retinal haze was observed in the lower portion. He referred to the relation of the spasm to permanent obstruction of the central retinal artery and also to the attacks of migrain, and believed that if permanent blindness should result it would be evidence in favor of thrombosis rather than embolism. He also called attention to the fact that although iridectomy had been performed in Wagenman's case, the patient became blind.

Dr. de Schweintz said that he had had the opportunity of examining this patient during an attack of blindness, and had witnessed the phenomena which had been described by the reporter. This retinal circulation resembled somewhat at the height of the attack the thread-like vessels seen in advanced cases of pigmentary degeneration of the retina, or, those that could be produced by various toxic agents which cause an intense ischemia, notably quinin in large doses, as he himself had frequently seen in experimental work. He had been unable during the attack, which lasted five minutes, to detect any edema of the retina, but had watched the refillings of the vessels and the unusual enlargement first of the inferior veins. During this attack there were no notable changes in the opposite eye. Dr. de Schweintz also referred to a case of so-called embolism of the left central artery of the retina, in which he had had the opportunity of making ophthalmoscopic examinations twenty minutes after the obstruction occurred. These phenomena were evident: The color of the disc was visible through a semi-transparent delicate haze, which covered its surface and spread out into the retina in a circular area of about a disc's diameter. Here the color of the haze was more decidedly gray. The macular region was invested with a similar but more milky haze, and in the center there was a typical cherry spot. These two banks of fog were separated by an area of unaffected retina. The entire arterial tree had very much dwindled, the vessels being represented by faint threads on which no light reflex could be traced. The shrinking of the arteries perceptibly increased during the ophthalmoscopic examination. In contrast, the veins seemed larger, although, as compared with the other side, they were much smaller than normal. In the lower temporal vein a moderately rapid circulation was visible, characterized by small cylinders of blood, separated by clear spaces which moved toward the disc, presenting very much the appearance that would be produced by mixing air and colored water in a tube. This patient had marked mitral regurgitation, with a strong systolic murmur and a moderate degree of cardiac hypertrophy.

In Dr. Harbridge's case there was no visible circulation in the veins during the attack. What the exact pathological condition was under the circumstances detailed is to a certain extent a matter of conjecture, but certainly it would seem that the phenomena are best explained by assuming the presence of a spasmodic contraction of the walls of the artery; indeed, we know from the observations of Schnabel and Sachs that even in partial real obstruction, be it embolism or thrombosis, two factors interrupt the circulation, one being the obstruction itself and the other the spasmodic contraction of the walls of the artery. Therefore it is probable that at some time or other in this patient's career, as has happened in other similar reported cases, this obstruction will become permanent by an increase of the doubtless existing endarterial changes.

Relation of Convergence to Accommodation.

Dr. Howard F. Hansell read a paper on the Relation of Convergence to Accommodation. It is admitted that about 75 per cent. of the cases of functional internal strabismus are due to uncorrected hypermetropia and in a proportion of these cases, if seen early in life, the strabismus may be cured by the rest to the ciliary muscle obtained by wearing proper correction for the refractive error. A small percentage of the remaining 25 per cent. may be due respectively to structural defects of the muscles, to abnormalities of the orbit, to disease of one eye, and other causes. Dr. Hansell called attention to a possible cause that has been practically overlooked, that may be accepted as explanatory in a few cases, namely, the primary innervation of the muscles of convergence independently of the state of refraction. He reported three cases in which the strabismus bore no evident relation to the refraction as a causative factor, In one, indeed, the stimulation to convergence in the interest of binocular single vision always induced myopia of 3 D. This case demonstrated the condition the reverse of that usually in evidence, the dependence of the refraction on the convergence rather than the convergence on the refraction. He emphasized the point that in investigating the etiology of strabismus, particularly in adult subjects, it is well to remember that the fault may lie primarily in the muscles of convergence.

Congenital Tubular Growth.

Dr. William M. Sweet, exhibited a boy, aged twelve years, with a Congenital Tubular Growth extending from the lower outer quadrant of the optic nerve directly forward into the vitreous. The mass was of a glistening white color, with somewhat broadened base, and numerous tent-like processes which extended to the upper and outer portion of the disc and the immediately adjacent retina. The apex was slightly rounded, and best seen with a plus 7.D lens. At the nasal side of the nerve margin large patches of chorioidal pigment were present. The lens was partially dislocated. No abnormality was found in the left eye. The case was believed to belong to the class of anomalies of the hylaoid, the dilated artery having undergone connective tissue changes. Dr. Sweet also showed a man, aged forty-three years, with a Gumma of the Lower Lid, which started as a small pimple on the skin, near the center of the lid, and spread until a furrow, 6 mm. wide and 5 mm. deep, with overhanging edges, extended the length of the lid, and about 5 mm. from the margin. A broken-down gumma also existed over the sternum. Under mixed treatment the ulcer of the lid had decreased in ten days more than one-half in size. C. A. VEASEY, M. D.,

Clerk of Section.

VIII.

Meeting, January 16, 1906, Dr. G. E. de Schweinitz, Chairman, presiding.

Essential Shrinking of the Conjunctiva.

Dr. Wm. M. Sweet exhibited a sailor, aged sixty-three years with Essential Shrinking of the Conjunctiva, which had existed for the past six years. The inflammation of the eyes was associated with a skin affection of both sides of the face, diagnosed as lymphoid psychosis. The atrophy of the conjunctiva affected both eyes, but was more pronounced in the lower cul-de-sacs than in the upper. In the left eye a new tissue mass extended from the lower outer limbus to near the center of the cornea, and a similar growth was beginning at the lower inner border of the right cornea. Adjoining the new tissue in the right eye was a circular area which stained with fluorescin, and probably marked the spot of a ruptured bulla.

Trachoma in a Negro.

Dr. Burton K. Chance exhibited a case of Trachoma in a young negro girl, the patient, however, not having the typical black color of the true negro.

Discussion.—Dr. Pyle stated that he had never seen a case of trachoma in the true negro. Dr. Thorington said that this was also the experience of Dr. Bruns, as well as himself, and wondered whether the disease would be any longer in disappearing than in other races more predisposed. Dr. de Schweinitz had seen a number of negroes with trachoma, but could not be sure that any of these negroes were of pure blood. Dr. Chance, in conclusion, said that he had an opportunity some years ago to examine the eyes of several hundred negroes on an island of the Bahama group and had not observed a single case.

Argyrosis from Argyrol.

Dr. Wm. Zentmayer exhibited for Dr. Posey a patient who had developed Argyrosis from the use of Argyrol. Patient had employed a 25 per cent. solution twice a day for two and a half months following an expression operation for trachoma. After discontinuing for two and a half months it was again employed for three to six weeks on his own accord. When examined later argyrosis was present, especially in lower cul-de-sac, but has since gradually lessened in intensity.

The Use of the Newer Silver Salts Compared with Nitrate of Silver.

Dr. de Schweinitz confined his remarks entirely, except in incidental mention, to protargol and argyrol. At one time he had employed protargol very freely as a substitute for nitrate of silver, but had found it comparatively unsatisfactory and had abandoned its use. He thought it was particularly objectionable because it secured no better results than nitrate of silver and was often markedly irritating. Also, it was very prone to produce argyrosis. He had employed argyrol first as a substitute for nitrate of silver in all forms of conjunctivitis, except diplobacillus conjunctivitis, in the treatment of purulent conditions of the lacrimo-nasal passages, in the management of infected corneal ulcerations, and in the preparation of the conjunctival sac prior to operations. In his earlier experience he had been inclined to think that argyrol was a satisfactory substitute for nitrate of silver in various conjunctival inflammations, and particularly in ophthalmia neonatorum, but within the last year had met with so many cases in which he had been obliged to abandon it and substitute nitrate of silver, that his faith in the remedy had been seriously shaken. He was satisfied that nitrate of silver properly applied in gonorrheal conjunctivitis of new-born babies and in gonorrheal conjunctivitis of adults frequently was a more satisfactory remedy, although he recognized its many disadvantages. He had been accustomed to employ argyrol by the so-called "immersion method" advocated by Myles Standish, Bruns, and other authorities, and continued to use it in certain cases, but not to the exclusion of nitrate of silver. He thought the plan advocated by Dr. Bruns, that after its use for a few days nitrate of silver should be applied once a day by the surgeon, and in the meantime the conjunctiva should be kept flushed with the argyrol, a good one. In many cases of gonorrheal conjunctivitis he did not believe that of itself it was a safe remedy, or, at least, as safe as nitrate of silver, and in a certain number of cases it failed completely and nitrate of silver had to be substituted. He continued to find it useful as an adjuvant in many forms of conjunctivitis, particularly of mild type, and thought it a satisfactory remedy for irrigating the lacrimo-nasal passages if purulent discharge was present. He also continued to find it useful in cleansing the conjunctiva, if there was hyperemia or slight discharge, preparatory to operations on the globe. Taking his experience as a whole, and it had been a very considerable one, he was satisfied that neither protargol nor argyrol represents in any sense a satisfactory substitute for nitrate of silver in gonorrheal affections of the conjunctiva. He recognized the importance of having fresh preparations of argyrol, which he was accustomed to employ in a strength of never less than 25 per cent.

Discussion.—Dr. Hansell agreed with the opinion of Dr. de Schweinitz regarding protargol and argyrol. He had given it a fair trial by dropping into the conjunctival cul-de-sac at regular intervals in gonorrheal cases and had found it unsatisfactory. It was his custom in these cases to employ irrigations with permanganate of potassium solutions, 1 : 3000 to 1 : 600, together with topical applications of nitrate of silver, grs. x to ʒj. He also insisted upon the constant application of ice as being of the utmost importance.

Dr. Thorington related the case of a soldier who had infected his wife and whose baby had gonorrheal ophthalmia. Protargol was employed by the physician and both eyes were lost. The attending nurse became infected. Topical applications of nitrate of silver were immediately employed, and later protargol with good results.

Dr. Zentmayer stated that he agreed with Dr. de Schweinitz in his experience. In his clinic at the Wills Hospital his assistant, Dr. Dewey, had practically abandoned the use of argyrol except in dacryocystitis, catarrhal conjunctivitis, and ophthalmia neonatorum. In the last two affections nitrate of silver is employed at the clinic and argyrol ordered for home use. He had but little experience in its use in gonorrheal ophthalmia of the adult, as such cases were not admitted to the wards of the Wills Hospital.

Dr. Ziegler believed that in gonorrheal ophthalmia nothing takes the place of silver nitrate, grs. x to ʒj, the excess being neutralized. Argyrol was a good adjuvant, but he had abandoned the use of protargol. He does not think that argyrol seems to be so good now as when first introduced.

Dr. Veasey stated that in view of the experience of so many of the members regarding argyrol, he almost hesitated to give his own. Protargol had been abandoned by him several years ago. Argyrol he had employed since its introduction, and during the past two years he had used it in cases in which he had formerly employed nitrate of silver almost to the exclusion of the latter. These cases were the different varieties of conjunctival disease in which there was more or less discharge, and corneal ulcers in which there was considerable sloughing. He had occasionally employed it in purulent lacrimal disease, but was always afraid of forcing some of the solution into the surrounding tissues. Indeed, this had occurred in one case in his hospital service, and there resulted a stain which was becoming gradually less marked when the patient passed from observation, three or four weeks later. His experience in its use in gonorrheal ophthalmia in the adult was very limited because none of the hospitals with which he was connected admitted such cases. It is his custom in using argyrol to have instilled into the conjunctival cul-de-sac a drop or two of a 20 per cent. to 30 per cent. solution immediately after each irrigation, no matter how frequently the latter is made, the frequency depending upon the rapidity of the formation of the secretion. Once a day he himself instills a much stronger solution—40 per cent. to 60 per cent. Formerly he applied this to the everted conjunctiva, but of late he simply instills it. He had thus far been disappointed, but seldom in the results obtained as compared with those obtained from the use of nitrate of silver, and thought that he had been able to lessen the profuse discharge of pus in ophthalmia neonatorum more quickly with argyrol than with the silver nitrate. He had always been careful to employ only freshly prepared solutions.

Dr. Pyle thought that nitrate of silver might do great harm in the hands of the unskilled. He related a bad result with great reaction that had followed the use of protargol, but he had never seen any ill result from argyrol. He had observed one case of staining in lacrimal disease, but the stain had disappeared in six weeks. He did not use protargol at all and employed argyrol in the manner described by Dr. Veasey. In purulent conjunctivitis he had obtained excellent results from the use of a 50 per cent. solution of boroglycerid twice a day.

Dr. Sweet stated that in some cases in which he had used argyrol he was obliged to substitute silver nitrate. He depended largely upon glycerin and tannin for chronic conjunctivitis.

Dr. de Schweinitz, in reply to a question as to his method of using nitrate of silver, stated that he seldom used a solution stronger than 2 per cent., and that after it had been applied to the everted conjunctiva he waited until a whitish film was formed, which was washed off and an application made of pure petrolatum.

Pneumococcus Conjunctivitis.

Dr. G. E. de Schweinitz described a case of Acute Pneumococcus Conjunctivitis of the left eye, followed in sixty hours by a similar conjunctivitis of the right eye, and twelve hours later by the formation of a *Large Bulla on the Center of the Right Cornea.* The base of the bulla was 5 mm. in diameter and its apparent height about 3 mm. There was some ciliary irritation and slight hyperemia of the iris. The bulla ruptured, the collapsed epithelial walls were removed, and the abraded surface remaining cauterized with nitrate of silver. Healing was uneventful, and at the end of a week there had been complete regeneration of the epithelium and vision was normal. At no time was there the slightest infection of the abraded surface, in spite of the surrounding purulent secretion, in which pneumococci were freely present.

Extraction of Steel from the Lens.

Dr. Howard F. Hansell reported a case of Extraction of a Piece of Steel from the Crystalline Lens by the Electric Magnet. He divided the operation in the case of this patient into, first, the cautious approach of the Sweet magnet until the fragment of steel was seen to leave its bed in the posterior part of the lens and slowly move forward into the anterior chamber through the pupil, accompanied by soft lens matter; and, second, an incision through the cornea at the site of the original wound of entrance of the foreign body and the extraction of the body from the floor of the anterior chamber by the application of the blunt tip of the magnet to the wound. The opaque and broken lens was expressed through the corneal opening. Dr. Hansell called attention to a possible fallacy in the localization schemes that had not been considered. The diagrams of localization by the X-rays are based upon the emmetropic eye, and no allowance is made for differences between the emmetropic eye and those that are highly myopic or hypermetropic. In a few instances the body might be located in the orbit or in the coats of the ball when its true site is in the vitreous, or vice versa. Again, in the case of a swollen lens the body might be described as in the vitreous when its real site was in the lens. Practically, such errors are seldom worth considering, but in making the calculations their possibility should be borne in mind.

Dr. Sweet said that the existence of a high degree of H. need only be considered in bodies that were localized in the chorioid or sclera, in which a smaller eyeball than normal would place the body in the orbit. In all cases of bodies shown to be in the sclera, several radiographs were made before finally deciding the position of the metal. Allowance was always made for the size of a child's eye. If a body is shown on the localizing diagram to be partly in the lens and partly in the vitreous, the substance must have occupied this position immediately after the injury, even though the lens by subsequent swelling may have completely enveloped the body.

Dr. Ziegler referred to a case seen two weeks before in which a foreign body had been located inside the globe, but which he was unable to remove with the magnet because it was outside the sclera, that might be explained by the points to which Dr. Hansell had called attention. He thought that all foreign bodies in the posterior segment should be extracted through a scleral incision.

Probable Bilateral Obstruction to the Central Artery.

Dr. Wm. Zentmayer presented a case of Probable Bilateral Obstruction of the Central Artery of the Retina. Following severe fright in the evening, the patient, a colored man aged

48 years, noticed failing vision in the left eye. The following morning this eye was blind and in R. E. only the lower field remained. Two days later the pupils were 3.5 mm. The ophthalmoscope showed in L. E. all of the arteries greatly contracted, the superior temporal a mere thread, veins enlarged, retina very hazy, but no cherry-red spot. In R. E. the same general appearance except that the inferior artery was alone greatly contracted. Patient has arteriosclerosis and high blood-pressure. Had used wood alcohol for cleaning silver and windows for past three years; none for three days previous to attack. Never had any intoxication symptoms. The treatment consisted of mechanical massage, digitalis, and nitroglycerin. Vision one month later: R. E., 5/v; L. E., 5/xv pt. The caliber of the arteries, except the superior branch in L. E., has improved somewhat. The nerves are pallid. The absence of toxic symptoms, the small pupils, the marked vascular disturbance and correspondence with blind area in field in R. E., and the steady improvement in vision favor obstruction. On the other hand, the use of wood alcohol, binocular lesion, and absence of typical obstruction-picture favor toxic amblyopia. Subsequent loss of the visual gain would make this diagnosis almost certain.

Discussion.—Dr. Ziegler related a somewhat similar case seen by him several years ago. He had also seen a case of complete recovery from methyl alcohol poisoning which had been produced by inhalation of the fumes for an hour daily.

C. A. Veasey M. D.,
Clerk of Section

BOOK REVIEWS.

Physicians' Visiting List.

The Physicians' Visiting List (Lindsay & Blakiston's) for 1906. Fifty-fifth year of its publication. The dose table herein has been revised in accordance with the United States Pharmacopoeia (1906). Philadelphia: P. Blakiston's Son & Co. (successors to Lindsay & Blackiston), 1012 Walnut street. Sold by all booksellers and druggists.

Blakiston's Visiting List and Physicians' Account Book needs no introduction nor does its past reputation call for additional lauding. It is all the busy practitioner could ask for his needs and is as useful to any specialist as to any general practitioner. Its various sizes allow its economical use by all.

The Pathology of the Eye.

Parsons J. Herbert., B. S., D. C. (Lond.), F. R. C. S. (Eng.), Assistant Surgeon Royal London (Moorfields) Ophthalmic Hospital, etc., Vol. II. Histology—Part II., octavo, pp. 389-770. New York: G. P. Putnam's Sons 27 and 29 West Twenty-third street, 1905. London: Hodder & Stoughton.

This carefully prepared and beautifully printed volume concludes the first or histologic part of Parsons's great treatise on the pathology of the eye. It deals with the Lens, Vitreous, Chorioid, Retina, Optic Nerve, Orbit and Lacrimal Apparatus. Nearly 300 illustrations serve to elucidate the text. An appropriate bibliography is appended to each article.

Parsons's book cannot be reviewed; it must be seen and consulted to be appreciated. Undoubtedly it is the authoritative work on the pathology of the eye, and will long be regarded as a precious contribution to ophthalmic literature. It should be found in the library of every ophthalmologist.

Atlas and Epitome of Operative Ophthalmology.

Haab, Dr. O., of Zurich. Edited, with additions, by George E. de Schweinitz, M. D., Professor of Ophthalmology in the University of Pennsylvania. With 30 colored lithographic plates, 154 text-cuts, and 377 pages of text. Philadelphia, New York, London: W. B. Saunders & Company, 1905. Cloth, $3.50 net.

In the Annals for October, 1904, the German edition of this book was reviewed. The present edition will prove exceedingly valuable to those ophthalmic surgeons who are not familiar with the German language. Dr. de Schweinitz has added editorial notes which are concise, timely and practical.

This new volume forms an admirable conclusion of the series of atlases on the Eye prepared by Professor Haab. Beginning with a thorough discussion of the proper construction of operation-rooms, narcosis, sterlization as applied to ophthalmic instruments, and disinfection, ophthalmic operations are described with all the fidelity and clearness that thirty years' conscientious practice in eye work naturally brings. The colored illustrations exhibit the same perfection of art and accurateness of detail which we have found in this invaluable series of atlases.

Squint, Causes, Pathology, and Treatment.

WORTH, CLAUDE, F. R. C. S., second edition, octavo, pages vii—231. Philadelphia, P. BLAHISTON'S SON & Co., 1012 Walnut street, 1905. Price, $2.00.

The first edition of this book appeared in 1903 and was reviewed in the October number of the ANNALS of that year (vol. xii, page 764). In the present edition nothing has been altered or omitted, but some small additions have been made. A German translation by Dr. E. H. Oppenheimer is soon to appear in Berlin (Messrs. Julius Springer & Co.).

The Ophthalmoscope and How to Use It.

THORINGTON, JAMES, A. M., M. D. With colored illustrations, descriptions, and treatment of the principal diseases of the fundus; 73 illustrations, 12 colored plates. Duodecimo, pp. xi-298. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut street, 1906.

Thorington's book is a welcome addition to works of its class. It is written in good English, is well illustrated and well printed. It contains 12 excellent colored plates made from drawings of the author's cases by Miss Washington.

On page 227 we notice that Mr. Warren Tay, who first described amaurotic family idiocy, has an extra "r" in his name. On page 194 the fourteenth line is shorter than its fellows. Objection might be made to some of the diagnostic tables which are contained in the book; but, of course, such tabulations are understood to apply only to the average run of cases.

Manual of Diseases of the Eye.

MAY, CHARLES, H., M. D. Fourth edition, revised, with 360 original illustrations including 21 plates, with 60 colored figures. Duodecimo, pp. viii-391. New York: William Wood & Co., 1905.

Among the numerous small books on ophthalmology, May's takes a high rank. Its popularity is evidenced by the rapid appearance of the English editions and by the fact that it has been translated into several foreign languages. The text for the present edition has been carefully examined and a number of alterations have been made. Some new figures have been added and some of the old illustrations have been replaced by better ones. The work is sure to be valuable to medical students and practitioners.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

Professor Dr. Adolph Sachsalber, of Graz, died December 29, 1905.

Dr. Mortimer Frank has moved his office to 103 State street, Chicago.

Privatdozent Dr. Paul Roemer, of Wuerzburg, has been made Professor.

Dr. Burton Chance has moved his office to 235 South Thirteenth street, Philadelphia.

Dr. Matthias Lanckton Foster has moved his office to 616 Madison avenue, New York.

With this issue Dr. Frank C. Parker, Norristown, Pa., becomes connected with the ANNALS.

Dr. Samuel Horton Brown has moved his office to 1901 Mount Vernon street, Philadelphia.

Mr. Claude Worth has been elected to the staff of the Royal London Ophthalmic Hospital (Moorfields).

Dr. F. B. Eaton, of San Francisco, has moved his office to the Shreve building, corner of Grant avenue and Post street.

The regents of the University Hospital, Ann Arbor, Michigan, have decided to erect a new building for eye, ear, nose and throat cases.

Dr. J. W. Stirling, of Montreal, has been elected to the chair of ophthalmology in McGill University, which was made vacant by the death of Dr. Frank Buller.

The Mexican Ophthalmological Society recently elected the following officers: President, Dr. D. M. Velez; Vice-President, Dr. J. Ramos; First Secretary, Dr. E. Graul; Second Secretary, Dr. M. Ramisey; Treasurer, Dr. E. F. Montano.

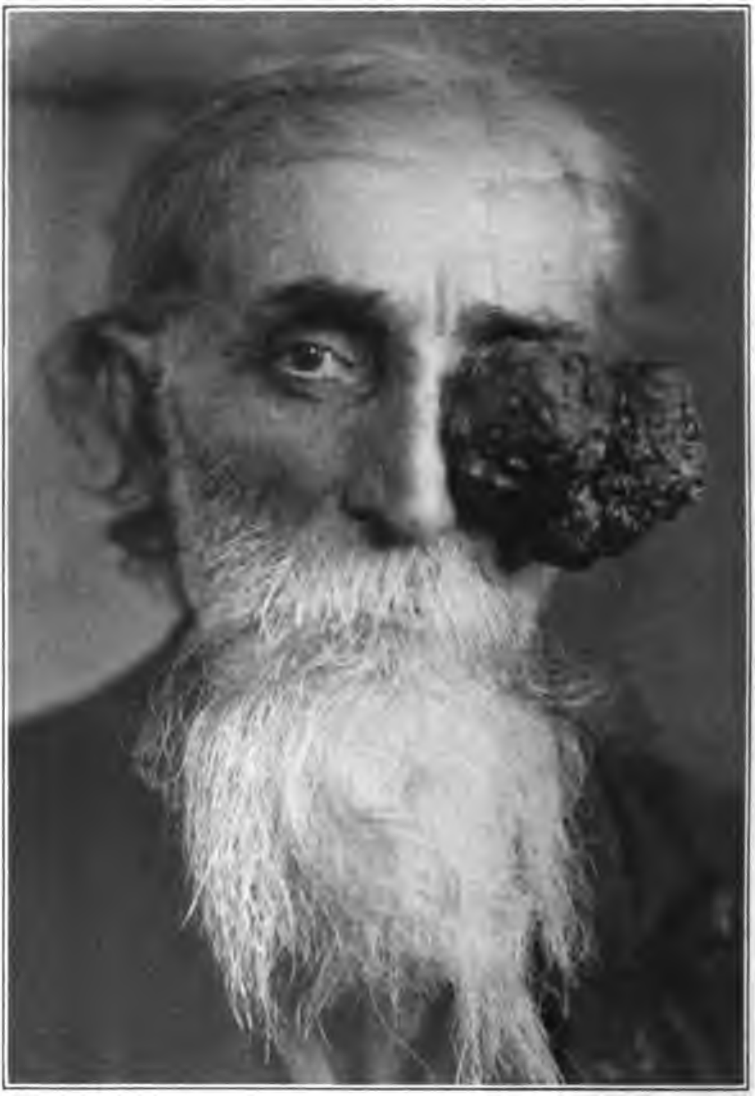
We regret to record the death of Baron de Wecker, one of the most eminent French ophthalmologists and author of a celebrated treatise on the eye. He was Von Graefe's chief of clinic, and was the associate of Arlt and Jaeger.

The Chicago Ophthalmological and Otological Society held its annual meeting January 9, 1906, and elected the following officers: President, Dr. George Fiske; Vice-President, Dr. Thomas A. Woodruff; Councilor to the Chicago Medical Society, Dr. W. H. Wilder; Councilor to the Ophthalmological and Otological Society, Dr. J. E. Colburn; Secretary, Dr. E. V. L. Brown.

The eleventh annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, will be held in Detroit, Mich., on August 30 and 31, and September 1. Mr. R. Marcus Gunn, of London, will deliver an address on Optic Nerve Ailments. The Secretary of the Academy is Dr. George F. Suker, Chicago. Dr. Eugene Smith, of Detroit, is chairman of the committee of arrangements.

Dr. Swan M. Burnett, of Washington, D. C., an ophthalmologist of wide reputation, died January 18, 1906. Dr. Burnett was the author of a Treatise on Astigmatism, also of Refraction of the Human Eye, and was a frequent contributor to ophthalmic journals. For many years he occupied the chair of ophthalmology in the Georgetown Medical School. He was born in Tennessee in 1847, and had resided in Washington thirty years.

An investigation as to the *Heredity of Albinism in Man* is being carried out by Professor Karl Pearson, F. R. S., of University College, London, England, with the co-operation of Mr. E. Nettleship (Shottermill, Surrey, England), and Dr. E. Stainer (Physician to the Skin Department, St. Thomas's Hospital), 60 Wimpole street, W., London, England, Cases bearing on the subject, *either positively or negatively*, will be very thankfully received by any of those gentlemen. The investigators desire to collect a large series of examples of Albinism—complete or incomplete, partial or general—in which the family history of the albino patient can be traced for one, two, three or more generations. The sex and prevalent color of eyes and hair in as many of the patients' relations and ancestors as possible should also be noted whether any of them were albinotic or not; also all instances of consaguineous marriage. Cases of Albinism of the eyes in persons with congenitally pied skin (most easily recognized amongst dark races) will also be very valuable even without family history—acquired leukoderma being of course excluded.



EPITHELIOMA OF THE OCULAR CONJUNCTIVA [JENNINGS]

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A CASE OF EPITHELIOMA OF THE OCULAR CONJUNCTIVA OF UNUSUAL SIZE.

By J. Ellis Jennings, M. D.,

PROFESSOR OF OPHTHALMOLOGY, MEDICAL DEPARTMENT,
BARNES UNIVERSITY.

J. W., aged 71, a vigorous and otherwise healthy farmer from Arkansas, consulted me at the eye clinic of the medical department of Barnes University, April 6th, 1906, on account of an enormous and unsightly tumor, which protruded from between the lids of the left eye.

The history of the case is as follows: About four years ago the patient noticed a small reddish swelling on the white of the left eye between the cornea and the inner canthus. Its surface became ulcerated and according to the statement of the patient "the little lump looked like a seed wart covered with proud flesh." The tumor grew slowly without pain, gradually extending over the cornea and projecting forwards between the lids, until by January 1st, 1906, it had reached the size of a large walnut. For the past four months it has grown rapidly until at present it measures four inches from nose to temple, three and one-fourth inches from brow to cheek and projects forwards three inches. The tumor is lobulated, of a reddish cream color, covered with scabs, bleeds easily and has a bad odor. It has a short pedicle and the patient can twist it around freely in all directions. A close inspection shows that the growth is attached to the conjunctival surfaces of both lids, but owing to the size of the projecting mass it was impossible to say whether it was attached to the eyeball itself. For this reason it was decided to remove first the tumor proper and afterwards deal with conditions as they presented themselves. Dr. Pinckney French very kindly consented to remove the overhanging growth and although cutting as close as possible to the base of the tumor, the section severed the eyeball at its equator. Seeing that the tumor was firmly adherent to the eyeball, both lids and the entire contents of the orbit down to the periosteum were removed together with a thickened portion of the skin of the cheek. After curetting the orbital cavity, it was packed with a long narrow strip of gauze and the gaping wound covered by undermining the skin of the brow and cheek and stitching them together. A microscopic examination kindly made by Dr. C. A. Vosburgh showed the growth to be an epithelioma of the ocular conjunctiva with infiltration into the cornea but not involving the other structures of the eyeball. The patient was discharged from the hospital in two weeks and I trust there will be no return of the growth.

507 Carleton Building.

PERSISTENT HYALOID ARTERY IN BOTH EYES—UNUSUAL VARIETY IN ONE EYE.*

By William T. Shoemaker, M. D.,

PHILADELPHIA.

The case presented was that of a white boy 15 years old, having in each eye the remains of the hyaloid artery, but showing in the right eye the most common form of this anomaly, and in the left eye a most uncommon form.

As is well known, the hyaloid artery with the cellular sheath surrounding the posterior portion, may persist in its entirety from the disk to the lens, and carry blood; or, almost every conceivable modification of this arrangement may be found.

The artery, not patulous, may persist throughout as a fibrous band. A remnant may persist attached to the disk, with an end free in the vitreous, with or without a portion of the lenticular attachment remaining.

The lenticular end may alone remain, with the posterior extremity free in the vitreous. Or, both ends may normally disappear, and shreds or cystic portions of some part of the artery or its sheath, be liberated in the vitreous, perhaps to be recognized later as "membraneous opacities," "floating opacities," etc.

The case presented shows in the right eye a very delicate, but long, almost invisible, strand with its free end in the vitreous, and fixed end traceable toward, and even on the disk, but I am sorry to say not quite to the central vessels. It eludes observation at the critical moment of conviction. But the evidence is, I think, sufficient to substantiate the diagnosis of persistent hyaloid in the more curious and interesting left eye.

In this eye is a large, quite freely movable, apparently tubular structure, which interferes at times with vision. When not in the way, corrected vision in the eye is $^5/_5$. Surrounding the apparent mouth of the tube, or perhaps cystic end, and running spirally around it backward, is a fine, sharp glistening strand or band. The proximal end is close to the lens. The distal end disappears without notice, and apparently has no attachment. Running from the forward end, fan-shaped upward toward the ciliary body are three very fine threads, stretched tight, and resembling guy ropes. These I believe furnish the key to the most probable explanation, viz., the neural extremity of the artery has disappeared, and likewise the lenticular extremity, with the exception of a few peripheral strands of the vascular tunic of the lens attached to the ciliary processes. What would otherwise be a liberated persistent section of the hyaloid is thus suspended from the ciliary processes by these three strands, and its posterior end is the really free end. So far as I know, no such arrangement of a persistent hyaloid artery as this would seem to be, has been observed, but I have made no careful search of the literature on this subject.

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*Case was shown before the Ophthalmic Section of the College of Physicians, Philadelphia, April 17th, 1906.

AMAUROSIS FOLLOWING ACUTE ANEMIA FROM HEMORRHAGE: A CLINICAL CONTRIBUTION.*

By Dr. Vittorio Carlini,

LIVORNO.

Translated from the Italian by V. L. Raia, M. D.,

PROVIDENCE, R. I.

The loss of sight from hemorrhage is relatively rare, and although known before the discovery of the ophthalmoscope, its nature is still obscure. That such an uncommon effect of the loss of blood has escaped a clear interpretation can be well understood when we consider its rarity, its different ophthalmoscopic aspects, the various circumstances under which it appears, and, lastly, the difficulty of a thorough examination. Post hemorrhagic amblyopia and amaurosis have been studied especially in relation to uterine and gastrointestinal hemorrhages, for these losses of blood produce more frequently disturbances of the visual organs. In 96 cases tabulated by Fries (1876) 34, (35 per cent) were of gastrointestinal origin; 24, (25 per cent), uterine; 21, (22 per cent), were caused by venesection; and 2, (2 per cent), by leeching. This percentage has not been modified by the report of new cases after 1876. In many observations the amaurosis was the result of insignificant loss of blood. In these cases the visual affection had not been prepared for by previous anemic conditions, the subjects of these alterations having been considered absolutely healthy. Consequently, there is no relation between the gravity of the hemorrhage and the appearance of the ocular disturbance. In fact, the traumatic losses of blood, although very profuse, rarely affect the eyesight. De Wecker and Knies, in the Franco-Prussian war, did not observe a single case of amaurosis following wounds. Only five cases in Fries' statistics can be attributed to a traumatic origin. After its publication no other cases have appeared, except one of Stirling, in 1904, in a boy affected by hemophilia, who, after a tooth extraction, lost the sight completely, a profuse hemorrhage having taken place. The nature of this pathological manifestation, which Gowers calls mysterious, and the interest which it may attract, encourages me to report a new case.

F. C., a young man, twenty-three years of age, strong and healthy, carriage-maker. Nothing worthy of consideration in his previous history. July 21st, while working on a piece of wood, he accidentally wounded himself on the wrist, and a profuse hemorrhage took place. For nearly twenty minutes he lost considerable blood, and when he could reach the hospital the physician found him unconscious, extremely pale, with filiform pulse, pupils dilated and insensible. After the ligature of the radial artery and an hypodermoclysis, the dangerous symptoms disappeared, and the general circulatory conditions rapidly improved. But consciousness returned the day after,

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*La Clinica Oculistica, February, 1906.

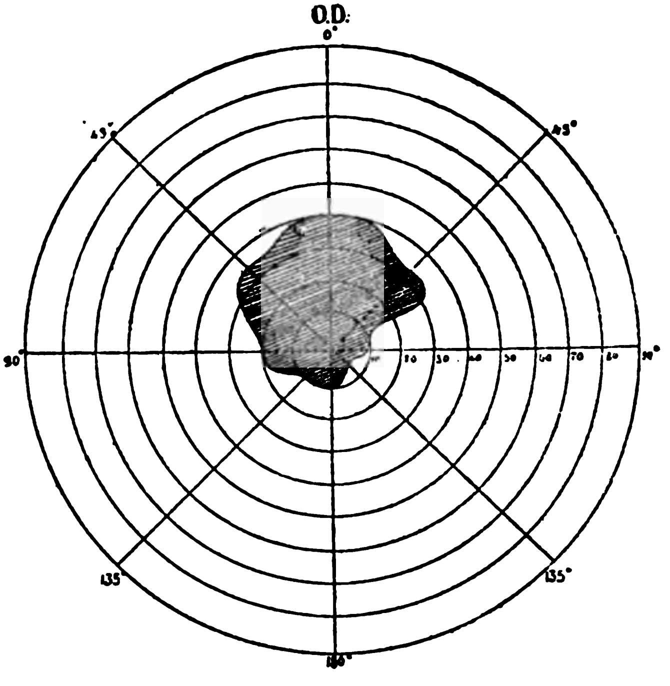

Fig. 1.

when the patient was made aware of his complete blindness. July 22nd, Prof. Baquis found the eyes apparently normal, except pupils dilated and pupillary reflexes abolished. The ophthalmoscope revealed perfectly transparent media and fundus normal. Refraction with its objective method gave for O. U. H. = 1.50 D. Both discs, arteries, veins and macular regions appeared normal. There were no retinal hemorrhages. Considering the case a very interesting one, I was charged by Prof. Baquis to repeat and complete the examination, and to follow carefully its course. Repeated examinations of the urine were always negative. Trinitrine as a vaso-dilator was prescribed. July 23rd, patient somewhat depressed; vision improved, being able to distinguish the movements of the hand, not to count fingers; pupillary reflexes slightly returned, fundus still normal.

July 24th, vision better; patient can count fingers.

July 25th, patient's general conditions are improved, so that he is able to get up and walk to the ophthalmic room. Pupils now promptly react to light. He can count fingers at one meter. The field of vision is irregularly contracted, completely abolished in the lower part, and on the upper part contracted on both sides in O. D., and only on the temporal side in O. S. (See Figs. 1 and 2.) General conditions are good.

September 4th—Vision O. U. = $^4/_{50}$. In two symmetrical sectors of the visual fields (the left lower sectors) we observe a large triangular area of contraction with the base at the periphery, giving thus the appearance of an incomplete left homonymous hemianopsia. (See Figs. 3 and 4.) Pupillary reflexes in the insensible parts of the retina are visible, although slightly diminished. Patient has been under tonic treatment and strychnin.

September 18th—V. O. U. = $^5/_{50}$. November 24th—V. and F. V. have remained the same. This case is one of amaurosis, following a traumatic hemorrhage of two days' duration, after which vision has gradually improved with no sensible alteration of the fundus. Simulation can be excluded here, for, while the insurance law on accidents is applied only when five workmen are employed, where the patient was working there were only three, and he had no right to receive any indemnity. Hysteric amaurosis may be suspected, but the course of the visual disturbance excludes it entirely. Our patient having recovered from the acute anemia, becomes healthy, shows no traces whatever of neurotic stigmata, while vision from the second day of the traumatism gradually increases until it gets to the present degree. This gradual improvement speaks against bilateral hysteric amaurosis, which appears and disappears suddenly, in consequence of high mental emotions. This rapid disappearance has been noticed by Briquet, Marlow, Wuerdemann and Pitres. In hysteria a concentric contraction has been often observed of V. F., while in our patient this contraction has been irregular and nearly abolished in the lower part, four days after the accident. Later on appeared and remained permanently a large triangular abolition of the V. F. in two symmetrical sectors, having thus an honomymous left hemianopsia. Homonymous hemianopsia may be observed in hysteria, but always in coincidence with other symptoms of the affection. Add to this the absence in our case of any chromatic disturbance, always present in hysteria with the concentric contraction of V. F. Let us see now the mechanism by which a hemorrhage has produced such a result. Scientific hypothesis appeared after the discovery of the ophthalmoscope; but the appearances of the fundus are so varied in the different cases that many interpretations have been given suitable only to each case observed. In some cases, very rare, like the present one, the ocular fundus and the discs have shown no alterations, even after a long time. In others, the papilla becomes pale after some weeks, or a few hours after the hemorrhage. (Chevallereau.) In another group, edema is observed of the papilla extending to the retina with hemorrhagic spots along the retinal vessels. Finally we can find a true

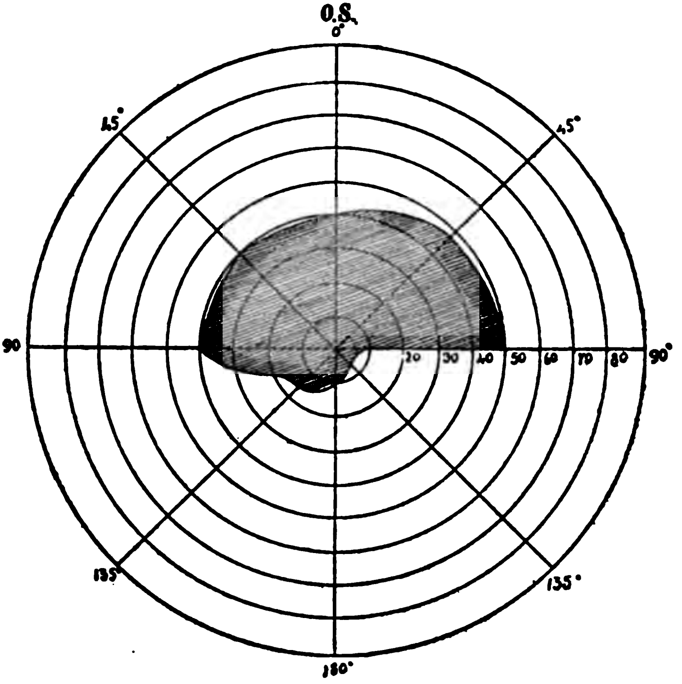

Fig. 2.

papillo-retinitis; the papillae are swollen with indistinct or blurred boundaries, veins large, arteries small, to which follows atrophy of the same. Besides the difficulty of giving an explanation to these different manifestations we completely lack the knowledge of the pathological histology of post hemorrhagic amaurosis. Only three post-mortem examinations are recorded—one by Hirschberg (1882), a second by Ziegler (1888), and a third by Raehlmann (1889). But nothing conclusive can be learned by these studies, having been made long after the appearance of the ocular symptoms. The alterations found in these cases belong to the last stage of the disease, and leave its course and development without any explanation. Ziegler's researches are more important, having been made twenty days after the beginning of the visual disturbances, which, under the ophthalmoscope, appeared under the form of a papillo-retinitis. He found a fatty degeneration of the nervous fibres, especially remarkable in those passing through the lamina cribrosa. In the connective tissue and medullary sheaths of the fibres of the optic nerve in the orbital tract, a large quantity of fatty drops were visible. In the retina the ganglionic and the nerve fibre layers were more altered and contained, especially around the papilla, fatty drops. In regard to the pathogenesis of the affection, only the hypothesis based on the accurate clinical observation of each case can be of true value.

Von Graefe, in 1860, published his theory, which was followed by many and sustained by Leber and Abadie. Graefe, having seen retinal hemorrhages and putting this symptom in relation to that well known of other organs, thought that in a similar way retro-ocular hemorrhages near or far from the eye, were apt to take place. The absence of lesions at the base of the brain induced him to localize the hemorrhage inside the sheath of the optic nerve, or even in the interstitial connective tissue of the nerve itself. As a consequence of this hemorrhage there is compression of the nervous elements, of the vessels and atrophy. This theory has been objected to, on the ground of not having been controlled at the post-mortem. Although little importance must be attached to the results of post-mortem examination in these diseases, we cannot deny that traces of the previous hemorrhages in the form of modified hematic pigment ought to have been found. On the other hand, amaurosis which has appeared two or three weeks after the hemorrhage cannot be explained on this theory. We cannot admit that such a compression on the optic fibres has not manifested itself for a long time. On the other hand, in cases like ours, in which no hemorrhages have been observed, this theory represents nothing else but a supposition.

Samelsohn, with his aspiration theory, proposes a very ingenious explanation of these post hemorrhagic amauroses. "While the hemorrhage takes place a portion of the blood in the cranial cavity makes its exit from this cavity with inextensible walls; the vacuum thus formed is filled up by the arrival of the lymph of the lymphatic sheaths of the blood vessels, and by the cerebrospinal fluid. Later on, when the movements of the heart regain their energy, and the mass of the blood is increased, the brain acquires its normal quantity. By increasing, then, the pressure in the cranial cavity, the lymph is repulsed in part in the lymphatic sheaths of the optic nerves, which are in communication with the subarachnoidal space." Through this accumulation of lymph the optic nerve is compressed, especially on its bulbar termination, thus causing a regular choked disk, which is the cause of the blindness. This theory also has no anatomo-pathological foundation, because we are unable to explain the cases in which the amaurosis came several days after the hemorrhage, and, as DeWecker says, is absolutely denied by the fact that in recent cases, when an ophthalmoscopic examination has been possible, no choked disk has been observed. On the other hand, even admitting its existence, (Stauungspapille of the Germans) we could not explain the loss of sight, it being well known that a choked disk due to accumulation of cerebrospinal fluid in the sheath of the optic nerve, is sometimes accompanied by no alteration of the vision. The aspiration theory can not explain especially my case, where no swelling of the papilla, no edema of the retina, were observed, even a few hours after the accident. The theory of a retrobulbar neuritis was accepted, especially by Knies (1893). This author says that in hemorrhage the blood pressure being greatly diminished, little or no blood enters the retinal and optic-nerve blood vessels. Their walls become altered, and when the blood pressure returns to the normal they may break and give place to extravasation of blood.

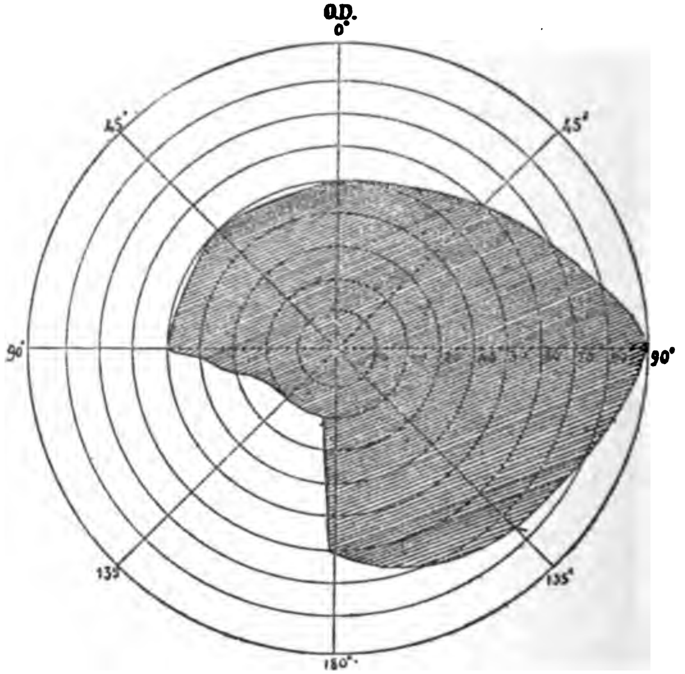

Fig. 3.

With this theory we explain the cases of neuroretinitis and those in which at the beginning nothing abnormal is observed with the ophthalmoscope on the fundus, and only very late atrophy.

This hypothesis of retrobulbar neuritis cannot explain those cases of severe papillitis which arise immediately after large hemorrhages, nor our case which a long time after the accident (more than five months) shows no decoloration of the papilla, and the central scotoma so characteristic in retrobulbar neuritis is totally wanting. The theory of retinal ischemia deserves now our attention. According to Fries, Westhoff, Terson, Gowers, etc., the cause of the amaurosis is the ischemia, which comes all at once in the retina when a hemorrhage takes place. How this retinal ischemia arises and acts is differently explained by the different authors. Most of them believe that this ischemia of the blood vessels is due or aggravated by a regular constriction of the arteries, the effect of which is a venous stasis, edema, hemorrhage and papillary atrophy. According to Hirschberg, the cause of this constriction is a pre-existing endarteritis; according to Ziegler and Terson a nervous spasm of the blood vessels from more irritability of the vasomotor centers, stimulated by the hemorrhage and general anemia.

Gowers considers the retinal layers the first to be altered by hemorrhage. "The shock produced by the anemia on the nervous elements is capable in certain cases to cause a temporary loss of function with their sudden or slow recovery taking place without ophthalmoscopic alterations. In other cases this does not happen, and we have atrophy. In a few others the lesion of nutrition caused in the retina may produce primary inflammation from the returned flow of blood of different degree, now slight and general, now very intense in the papilla." The idea of pre-existing endarteritis (Hirschberg) in my case as in similar others is inadmissible, the cardiovascular apparatus being absolutely normal. The hypothesis of a spastic contraction of the small vessels (Ziegler, Terson) can neither be refused nor accepted. Having seen directly with the ophthalmoscope, this spasm is of little importance, the observation having been made the day after the hemorrhage. Probably this anemic spasm has been present in the first hours after the accident, being transitory, as are all other nervous actions. But the spastic contraction of the small vessels could explain in my case the visual disturbance, if this had been transitory. When this spasm disappeared the normal function of the retina ought to have returned to the normal, no visible consequence of the anemia being visible. To show that a transitory vasoconstriction can not explain in our case the permanent visual disturbance, it is enough to consider what takes place in quinin amaurosis, in which a remarkable vasoconstriction of a long duration is seen, although the central vision returns to the normal. But the supposition of an arterial constriction may seem useless in our patient, as it is well known that if at the beginning of the hemorrhage the blood pressure keeps on through the intervention of vasomotor centers, this is not so when the loss of blood constitutes one-fourth of its total mass. Then, if the blood continues to flow, the pressure becomes so low that the blood circulating in the retinal vessels diminishes considerably. Following Gowers' conception, we think that through a disturbed circulation, the nutrition of the ganglionic layer is deeply altered, that the elements become asphyxiated in a first period, and subsequently suffer a series of regression, the last term of which may be the fatty degeneration observed by Ziegler. This theory of the retinal ischemia can not explain the majority of cases, in which the amaurosis becomes evident two, three, four or more days afterwards, when the circulatory conditions are improved; it can not be called in support even in my case, although it possesses all the appearance of simplicity; and this specially for one consideration that after five months we notice no traces of decoloration of the papilla, while the visual disturbance is permanent and involves nine-tenths

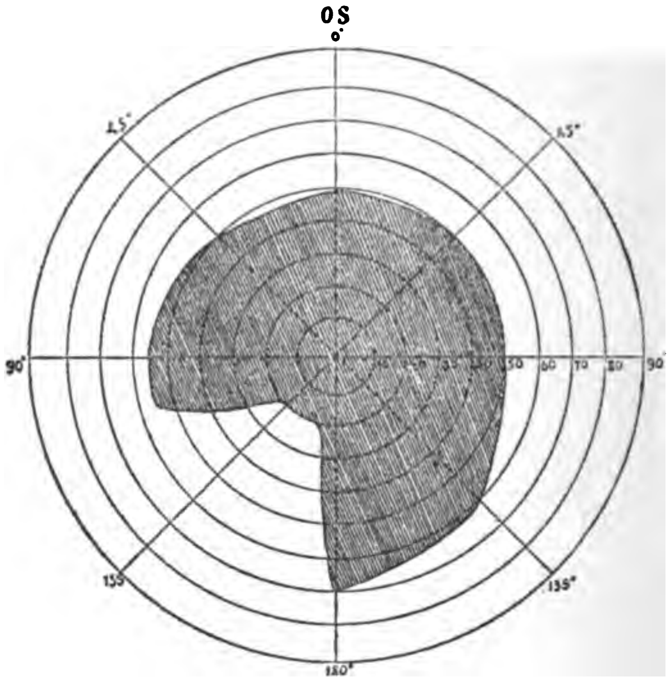

Fig. 4.

of the visual elements. Admitting a nutritive lesion of the ganglionic cells, partial atrophy of the disc ought to be present at least, for the optic fibres are nothing else but a prolongation of the same cells, which represent their trophic centers. My case being one of a traumatic hemorrhage, it is not necessary to discuss Samelson's hypothesis in regard to some cases of slight gastrointestinal hemorrhages. This hypothesis was founded on the experimental work of Brown-Sequard, Schiff and others, and supposes a lesion of the nervous centers, which is the cause of the hemorrhage and amaurosis. This central lesion would produce effects similar to the experimental destruction of the anterior tubercula-quadrigemina, which provokes the appearance of gastric hemorrhages. We must, on the other hand, consider the hypothesis of a cortical lesion discussed by Berger, who, in the *Encyclopedie Francaise d'Ophtalmologie,* speaks of a transitory edema of the cortical centers of vision, and by Terson for the rare cases of hemianopsia. In my case, in fact the alteration of the visual fields resembles an incomplete homonymous hemianopsia of the left side, and consequently we have all the reason to suppose a lesion of the cortical visual centers. Hemianopsia has been rarely mentioned by the authors, as a consequence of hemorrhage. If we except a few dubious observations in which the ophthalmic and perimetric examinations were not made, in all the literature of the subject we can not find more than four cases of hemianopsia. Of these, two belong to Pflueger, one to Chevallereau and one to Panas; and all have been observed in uterine hemorrhage. Hemianopsia has been complete or incomplete, but the complete or incomplete suppression of the homonymous halves of the visual fields has been the initial visual disturbance. But in our case have we to do with a real hemianopsia, or with an irregular contraction by sectors of V. F.?

The fact that vision, from its complete abolition slowly gets to $^1/_{10}$, would at first exclude the possibility of the existence of hemianopsia. In fact, according to most of the neuropathologists in homonymous hemianopsia, even incomplete, either basal or cerebral, central vision remains intact. This, in some cases, may persist in the so-called double hemianopsia (bilateral cortical lesion; a fact which would confirm Monakow's opinion that the macula is not in relation with the cortex. I think that in our case, with such an alteration of the V. F., the degree of vision is of no consequence, the visual trouble having begun as an amaurosis, and only after a long time, when vision had gradually improved, an incomplete but permanent hemianopsia had appeared. The amaurosis, we believe, had arisen from an alteration affecting both optic cortical centers in their totality; the homonymous incomplete left hemianopsia shows that the left optic center of the cortex has been affected the more by the consequences of the anemia; the low vision regained ($^1/_{10}$)

is the index of a persistent alteration in both the visual centers. The normal pupillary reflexes exclude any lesion in the optic tracts from their beginning in the retina to the external geniculate body, the pulvinar and the anterior corpora quadrigemina. It must be an alteration of the cortical visual center, and the convulsions to which the patient has been subject immediately after the hemorrhage confirm this view. The cerebral arteries. like the retinal, are terminal, and consequently we can suppose (with Terson) that the ischemia of the cortical visual centers and its consequences (permeability of the walls of the altered blood vessels, edema, infracts), in some cases is apt to produce permanent lesions, with partial or total loss of this cortical center. The diagnosis of a cortical lesion explains well the amaurosis at the beginning, and the consecutive hemianopsia in our case, in which no ophthalmoscopic alterations of the fundus has been visible, even after five months.

I intend to apply this interpretation only to this particular case, being perfectly in accord with Gowers, and De Lapersonne, who admit that the pathogenesis of the post hemorrhagic amaurosis is variable in the different cases.

BIBLIOGRAPHY.

Assicot—Pathogenie des amauroses post-hemorragiques. Archives d'ophtalmologie, p. 322, mai, 1902.

Borsch—Sur un cas d' amblyopie passagere a la suite d' hemorragie et sur un cas recent d' amaurose double apris hematemese. Annales d'oculistique, Avril, 1898.

Chevallereau—Sur un cas d'atrophie papillaire brusque consecutive des hemorragies uterines. Archives d'ophthalmologie, Juillet, 1903.

Devain—Amblyopies et amauroses consecutives aux hemorragies gastro-intestinales. These de Lyon, 1900.

Foerster—Graefe-Saemisch. T. VII, p. 73, 1876.

Fries—Klin. Monatsbl, fuer Augenheilk. Beitraege, 1876.

Gauran—Des cecites subites et definitives consecutives aux grandes hemorrhagies. (Union medic. de la Seine-Inferieure-Rouen, XIX p. 11), 1880.

Gendron—Etude sur quelques cas d'affections oculaires d'origine uterine. These de Paris, 1900.

Gowers—Oftalmoscopia medica. (Ediz. Italiana), 1890.

Graefe (Alfred)—Ischemia retinae, (Arch. f. ophth., T. VIII, p. 142), 1862.

Hirschberg—Centralblatt fuer prakt. Augenheilk., 1882.

Hirschberg—Veraenderungen des Augengrundes bei allegem. Anaemie. (Comptes rend. de la Societe ophth. de Heidelberg p. 53), 1877.

Hutchinson—Very profuse haematemesis. Attack of several general spasms three days later, followed by failure of sight. No ocular change. (Ophth. Hosp. Kep., VI 3), 1869.

Jacobs—Haematemesis, etc., beiders amaurose. (Berlin Klin. Wochenschr., n. 4), 1868.

Knapp—Fall einseitiger Erblindung in Folge vom ischaemia retinae. Arch. f. Augenheilk., T. X, 1 p. 101), 1880.

Knies—Die Beziehungens des Sehorgans und seiner Erkrankungen, p. 301), 1893.

Lagrange et Valude—Encyclopedie francaise d'ophtalmologie, 1905.

Landesberg—Drei Faelle von amaurose in folge vom Blutverlusten. (Klin. Monatsbl. f. Augenheilk., p. 95), 1877.

Leber—Die Amaurose nach Blutverlusten. (Handb. de Graefe et Saemisch, T. V, p. 901), 1877.

Malliotis—Les troubles visuels graves apres les pertes de sang. These de Paris, 1898.

Mierny—Petersb. medic. Bote (Amaurose apres une saignee copieuse) analyse in Nagel Jahresber., 1875.

Mooren—Ophthalm. Beobacht., Berlin, p. 310, 1867.

Nagel—Die Strychninbehandlung der Amaurosen, etc. Tuebingen, p. 31-34, 1871.

Pergens—L'amaurose et l'amblyopie apres hematemese. Annales d'oculistique. Janvier, 1896.

Pflueger—Citato da Cohn. Uterus und Auge, 1890.

Roeblmann—Fortschr. d. mediz., p. 928, 1889.

Samelsohn—Ueber Amaurosis nach Hematemesis ut Blutverlusten anderer. (Arch. f. Ophth., XVIII, 2, p. 225), 1875.

Samelsohn—Zur Pathogenese der Fulminanten Erblindungen nach Blutverlusten. (Ibid., XXI, I, p. 150), 1875.

Stirling—Bilateral amaurosis following severe hemorrhage after extraction of a tooth, partial recovery. Ophthalmic Review, August, 1904.

Terson—Les troubles visuels graves apres les hematemeses et les metrorrhagies. Semaine Medicale, p. 245, 1894.

Terson—Atropie partielle des nerfs optiques a la suite d'une hematemeses. Journal des Praticiens, 1897.

Von Graefe—Faelle von floetzlicher und incurabler amaurose nach Magenblutung, etc. (Arch. f. ophth., T. VIII, 1, p. 209), 1860.

Von Graefe—Arch. f. Ophth., T. XII, 2, p. 149, 1866.

V. Oettingen—Amblyopien u. Amaurose nach Blutverlust. (Dorpat. med. Zeitschr., VI), 1877.

Westhoff—Ueber ploetzliche Erblindung u. Blutverlust. Greifswald, 1889.

Zeigler—Beitraege zur pathol. Anat., Bd. XXII, 1888.

DIONIN IN OPHTHALMIC PRACTICE.*

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In the *British Medical Journal* of April 30th, 1904, I wrote a short note on dionin as an ocular analgesic, and called attention to the remarkable powers of this new agent introduced by Darier,[1] at that date practically unknown in ocular therapeutics in this country. Since then I have made extensive use of it both in hospital and private practice, and my increased experience has not only impressed me still further with its great value, but also has extended its applications in ophthalmic practice. I have therefore thought that a further communication would prove interesting to many, as only the most meagre information about the important uses of this new drug in eye work is to be found in English medical literature.

Dionin, or ethyl-morphin hydrochlorid, although used for some time in general medicine as a sedative to replace codein and morphin, was first used in ophthalmic practice by Darier as an ocular analgesic. It is a white, odorless, crystalline powder, freely soluble in water. As an analgesic I have used it chiefly in 5 per cent. aqueous solution or made up with vaselin as an ointment in similar strength. When there is great lacrimation, I prefer to use it as an ointment, because the aqueous solution gets rapidly diluted with the tears and washed away, whilst the ointment introduced into the conjunctival sac adheres until it is gradually melted and absorbed. When this 5 per cent. solution or ointment is introduced into the conjunctival sac it does not change in any way the sensitiveness to touch of the cornea or conjunctiva, and hence is of no use for the removal of foreign bodies or for operations of any kind on the eye. But if the patient is suffering from pain the result of disease or inflammatory processes in the eye, such as is met with in iritis, iridocyclitis, glaucoma, ulcer, or corneitis, the introduction of the dionin has a markedly soothing effect, and in many cases gives for several hours complete relief from the severe pain which often accompanies these affections. Dionin is therefore not an ocular anesthetic, but a powerful ocular analgesic.

The ocular analgesics which are most widely used at present are cocain and holocain, which are both anesthetics and analgesics. At the meeting of the British Medical Association in 1898 at Edinburgh,[2] I made a communication on holocain, in which I pointed out its great superiority to cocain as an analgesic in relieving the deep-seated pain of ocular disease. Cocain is least satisfactory for this purpose, and in such affections as iritis and glaucoma often actually increases the pain, probably by increasing the tension of the eye. I have recorded a case[8] where an attack of acute glaucoma was brought on by the use of cocain, and hence this drug can be used only with the greatest caution in diseases of the eye. The introduction of holocain, free from all the dangers of cocain and with a more powerful analgesic effect, was therefore a distinct advance in ocular therapeutics. Dionin neither dilates the pupil nor elevates the tension of the eye and hence is free from the dangers of cocain. It is superior as an analgesic, even to holocain, and therefore holds the first place as the agent for relieving the deep-seated pain in the eye which is met with in such diseases as iridocyclitis, glaucoma and corneitis. In the hospital I carried out a careful series of comparative experiments with three solutions—5 per cent. cocain, 1 per cent. holocain, and 5 per cent. dionin—in order to determine the degree and duration of the relief afforded to the patient from the pain attendant upon ocular diseases.

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*British Medical Journal, May 12, 1906.

Both as regards the degree and the duration of the relief afforded, I found dionin the most powerful agent, next to it holocain, and a long way inferior to both cocain. The dionin drops or ointment may be used freely every two, four, six, or eight hours, according to the severity of the pain and the effect produced. It is an agent which can do no harm and hence its great value. There is, however, an occasional effect produced by dionin at its first use regarding which the patient must be carefully warned, otherwise it may harm him very much and lead him prematurely to abandon the use of the drug. After the first instillation it may cause a feeling of burning irritation, followed by an intense chemosis of the conjunctiva, which may swell up and even overlap the cornea. This, however, need not cause the slightest alarm, as the chemosis very rapidly subsides. It is a symptom which may even be welcomed, as in these cases the analgesic effects of the drug seem to be the greatest. It appears only after the first or second instillations, never after subsequent ones.

As on the first instillation of dionin into the eye there is often a feeling of burning and irritation, it is advisable always to begin with a weak solution, not stronger than 2 per cent., and gradually increase the strength, so that in the course of a few days 5 per cent. may be used. When the drug has been used for some time it may even be used in stronger solution than 5 per cent., and I have on several occasions used the pure dionin powder with great relief to suffering. This can only be done, however, when the eye has become thoroughly accustomed to dionin.

I have of late used dionin with great success in a class of cases in which it is often very difficult to give the patient any considerable measure of relief, those met with chiefly in neurotic and neurasthenic patients, in which a constant feeling of soreness and discomfort in the eye is complained of even apart from use. No disease or abnormality may be discoverable on careful examination, and yet the patient constantly complains of the feeling of soreness. In these cases I have found the use of weak dionin drops (1 or 2 per cent. at most) exceedingly grateful to the patient, and giving considerable relief to the symptoms. The drops should be used three or four times daily. The burning sensation at first experienced after instillation will rapidly disappear, and after a few days no discomfort will be experienced. I have found dionin also of great service in the ocular pain complained of as the result of eye-strain. We are all familiar with cases where the subjective examination of the patient with the test types is almost impracticable, owing to the irritable and painful condition of the eye consequent upon severe strain. In such cases a few days' rest and the regular use of weak dionin drops (1 or 2 per cent.) have a most favorable effect, relieving the patient from his discomforts, and enabling a satisfactory examination of the eye to be made. There are many cases where we cannot use with safety atropin or homatropin, and in these dionin is most valuable to us as an ocular sedative, but for this purpose it need only be used in very weak solutions (1 per cent. as a rule).

The most recent discovery regarding the use of dionin is that it possesses a remarkable power in clearing up opacities of the cornea, and for this purpose alone would be a most valuable agent. When first I used it in cases of corneitis in order to relieve the pain, I observed that the corneal infiltration disappeared with great rapidity and completeness. This led me to use it in cases of corneal opacities which presented themselves after all the inflammatory symptoms had disappeared. When the opacities were of recent origin it was invariably found that dionin had quite a remarkable action in clearing them up. During the last two years I have been habitually using dionin for this purpose, and have made comparative experiments with dionin and the other methods usually employed for this purpose. As the result of a large experience, I can say that no other method employed for the clearing up of corneal opacities can be compared with the results obtained by the use of dionin. The more recent the opacities the better were the results, but even with old-standing opacities improvement may be derived from the treatment.

In the treatment of corneitis, when there is much infiltration, I always combine the atropin with 1 or 2 per cent. of dionin. This answers the double purpose of relieving pain and hastening the absorption of the corneal infiltrate. It was found particularly useful in cases of interstitial or parenchymatous corneitis, but I employ it in all forms of corneitis. When the inflammatory symptoms have subsided the atropin is stopped, but the dionin is continued alone for a considerable time.

For the clearing up of corneal opacities I always employ dionin in the form of an ointment. I begin with a weak ointment, 4 gr. to the ounce, and gradually increase the strength up to 12 gr. to the ounce. A little of the ointment is inserted under the lids and the cornea is gently massaged through the closed lids for a short time, at first once and subsequently twice daily. If this were to be done at first with a strong ointment considerable irritation might ensue, but by beginning with a weak ointment and gradually increasing the strength, little or no irritation is experienced. The treatment conducted in this way may be continued for a considerable time with little or no discomfort to the patient, and with a very decided effect in clearing up the corneal opacities, more especially if these are of recent origin.

As an agent for the relief of pain in diseases of the eye, as a soothing application in hypersensitive and irritable eyes, and, above all, as the most powerful means at our disposal for the clearing up of corneal opacities, dionin is destined to occupy an important place in ocular therapeutics.

REFERENCES.

[1] Darier, Lecons de Therapeutique Oculaire.
[2] British Medical Journal, 1898.
[3] Ophthalmic Review, 1900.

A SERIES OF SIXTY-THREE CASES OF DESCENDING OPTIC NEURITIS, PROBABLY THE RESULT OF PNEUMOCOCCAL INFECTION.*

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In 1904 I gave an account of 42 cases of descending optic neuritis in the special section of the Medical Congress. My audience was small, and I hoped to gain greater publicity for the subject in the local (Capetown) *Medical Journal,* but the paper was refused, on the ground that it was of too technical a nature to be appreciated. Since then 21 more cases of a similar character came under my observation, and I venture now to publish the whole series, in the full belief that the subject will be found of great general interest to my medical brethren.

At the Medical Congress held in Johannesburg, in the year 1898, a most valuable and suggestive paper was presented by Drs. Brodie, Rogers, and Hamilton, entitled "A Contribution to the Pathology of Infection by the Pneumococcus." The monograph referred to dealt with two epidemics of pneumococcal infection in 1894 and 1898 amongst the native miners on the Rand.

In the first epidemic there were about 100 cases, and they were characterized by a purulent discharge from the nostrils, and in the large majority of cases by pneumonia. Fifteen died, and nine post mortems were performed. In all the autopsies a livid, swollen condition of the pituitary membrane, with a purulent discharge, was noticed. In some lobar pneumonia was found, in others meningitis; in one, purulent meningitis and pneumonia, with pus cells filling the nasal sinuses and ethmoidal cells, and in one there was no pneumonia or meningitis—this was a case of acute septicemia. No bacterial investigation was made.

The second epidemic, that of 1898, was of a more serious nature. During the cold months of June and July several hundred Kaffirs arrived in very poor condition. In a few days almost all these boys were suffering from nasal catarrh and coughs, and a large number were admitted into the hospital suffering from pneumonia, diarrhea, dysentery, parotitis, and, in two cases, meningitis. Forty-eight died.

This epidemic exhibited similar characteristics to the previous one, except that several cases died of diarrhea passing on to a dysenteric form. Lobar pneumonia was a common symptom, but in no case was of sufficient extent to be the cause of death. Cerebral meningitis, taken as a symptom, was almost a negative quantity, which was remarkable, considering the frequency with which purulent cerebral meningitis was found post mortem.

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*Transvaal Medical Journal, January, 1906.

Twenty-six autopsies were performed.

In all there was marked rhinitis with a purulent discharge from the nose. The mucous membrane of the nose and adjacent sinuses showed every stage of inflammation: hyperemia, edema, purulent infiltration and ulceration followed by atrophy. In many cases necrosis of the bony walls resulted from an extension of the inflammatory process. Within the skull the meninges of the brain exhibited marked changes. There was purulent infiltration of the pia-arachnoid, extending over the whole of the base of the brain and spreading upwards on to the hemispheres.

The exudation in some cases was jelly-like, homogeneous and clear; and in others, fluid, opaque, and granular.

The lungs showed croupous pneumonia in all stages from congestion to gangrene.

In the dysenteric cases there were no gross changes in the intestinal tract.

Careful bacteriological examinations were made, with the result that the diplococcus of Fraenkel, or pneumococcus, was found variously in the cerebral exudation, in the nasal secretion, in the blood, the lungs, the peritoneal fluid, and the spleen.

The conclusions arrived at by the authors of the paper I will quote in their own words:

"1. That the diplococcus we have described is identical with the pneumococcus of Fraenkel, but that probably it is of a more virulent type.

"2. That the pneumococcus causes cerebro-spinal meningitis.

"3. That in these cases the pneumococcus first affects the nasal mucous membrane and produces there a definite local lesion (rhinitis), and that all other subsequent pathological effects, infection of frontal and nasal sinuses, middle ear suppuration, parotitis, pneumonia, and meningitis, are merely the result of the extension of the organism along various anatomical channels of infection, that is, by continuity of tissue, lymphatics, or blood stream.

"4. That a pneumococcal septicemia, the result of a pneumococcal rhinitis, even when unattended by such secondary effects as pneumonia or meningitis, is sufficient to cause death."

No evidence was produced of any eye complications being observed in either of these epidemics. We are dealing, therefore, with a specific infectious disease caused by the pneumococcus, which in the majority of cases makes its entry through the nasal mucous membrane. The natives of South Africa are evidently peculiarly susceptible, for there are no records, so far as I can discover, of this disease in the epidemic form just described in any other part of the world, and there has been no epidemic amongst the white population of the Transvaal. This disease, when it attacks a group of natives, infects nearly all of them, but in varying degrees. Many suffer only from general malaise, nasal discharge and cough, and these cases are often mistaken for influenza. In some the disease is very acute, and takes the form of an acute septicemia, to which they succumb in a few hours. In others we find the secondary manifestations already described.

The fatal cases all die of septicemia; the lobar pneumonia, meningitis, dysentery, and other complications being only contributory factors.

Let us briefly compare this description of pneumococcal infection with that of epidemic cerebro-spinal meningitis, and we shall find many points of similarity between the two diseases.

In epidemic cerebro-spinal meningitis, we have a specific infectious disease caused by the diplococcus intracellularis of Weichselbaum, or the meningococcus. A nasal discharge has not been demonstrated in all the cases, but it has been observed, and in one case the meningococcus was found in the nasal secretion. It is not unlikely that careful investigation on this point will elicit the fact that the nasal mucous membrane is the point of primary infection by the meningococcus, as it has been shown to be by the pneumococcus.

The clinical course is very similar.

We have in some cases an acute septicemia, often with a purpuric rash, causing death in a few hours—the malignant form.

In others, the secondary manifestations of cerebro-spinal meningitis or pneumonia are the paramount features of the disease, and the cerebro-spinal type is the most constant and the most marked.

Post mortem, the malignant cases show extreme congestion of the brain and spinal cord, and nothing else. Acute fatal cases exhibit intense inflammation of the pia-arachnoid, with purulent exudation and lobar pneumonia.

The two diseases, therefore, are to a marked degree alike, both in clinical features and in pathological appearances, the chief points of difference being that in epidemic cerebro-spinal meningitis the symptoms of cerebro-spinal irritation are of much more frequent occurrence than in epidemic pneumococcal infection. However, this may possibly be explained by the fact that the epidemics we are discussing have occurred amongst natives, and though, as has been demonstrated by the autopsies, meningeal complications occur just as frequently amongst them, the disease, so far as clinical symptoms are concerned, remains latent.

But the chief difference between the two diseases is that the one is an infection by the pneumococcus, the other an infection by the meningococcus. It is an interesting fact, however, that several observers, and amongst them Councilman and Netter, have found the diplococcus of Fraenkel in cases which have been proved to have been infected with the diplococcus of Weichselbaum, and I believe the reverse condition has been seen—namely, the presence of the meningococcus in cases of pneumococcal infection.

It has even been suggested that there is no difference between the two diseases, and that the two forms of diplococcus simply represent different stages in the life history of the one germ. Their morphological characters and their behavior to reagents do not, however, support this theory. The *meningococcus* is very similar in appearance to the gonococcus; the cocci are rounded in shape, and occur in pairs or in groups of four. There is no distinct limiting membrane, and it does not stain by Gram's method. The pneumococcus is lanceolate in shape, and occurs in pairs, the cocci being arranged end to end, and not side by side; a distinct limiting membrane can be demonstrated, and it readily stains by Gram's method.

It does seem, however, that these several diseases do, to a certain extent, run concurrently, and the probability is that the conditions which encourage the activity of the one organism have a similar effect in encouraging the other.

My object in drawing your attention to the very similar character of the two diseases is that when we come to discuss the affection of the eye in pneumococcal infection we may naturally expect to find somewhat similar appearances and symptoms to those which are described in meningococcal infection.

The affections of the eye in epidemic cerebro-spinal meningitis have been very carefully studied, and the following conditions have been noted:

1. A descending neuritis of the optic nerve, followed by acute papillitis and post-papillitic atrophy. This condition was found in six of forty cases examined by Randolph.
2. A suppurative chorioiditis, extending forwards to the iris, caused by direct infection through the intervaginal space, or through the vascular system.
3. A purulent conjunctivitis, sometimes complicated by keratitis, which is said to be due to inflammation of the fifth nerve. I am inclined to think that this latter explanation is somewhat far fetched, and would suggest that it is caused by direct infection from a nasal secretion which has been overlooked.

We now come to the epidemic of 1903. In the month of June, 385 British Central African natives arrived on the Rand. Except for the fact that a large percentage of them were old, that many were scorbutic, and others were sufferers from malarial fever, they were quite up to the average of arriving natives. They were consequently sent to work. Within a month there were not more than sixty of these natives who were not showing signs of illness, and within a short time over 200 of them were admitted into the hospital, suffering from nasal discharge and coughs, and, in the majority of cases, from pneumonia.

The clinical history of this epidemic was similar to that of the previous epidemics, except that there was more evidence of meningeal complications, some of the cases even showing symptoms of special irritation.

Thirty-five of these natives died; the remainder became convalescent, and in course of time were sent back to work. It was then noticed that some of these, on going below the surface, complained of being unable to see. They were sent up again, and were then apparently quite able to see their way about, and to do anything that was required of them. Several attempts were made to get them to work below, with the same result; directly they came into the dark surroundings of the underground workings they groped their way about like blind men, and were quite useless.

It was then decided that further information must be obtained as to the condition of their sight, and I was asked to make an investigation. In all I have seen 63 cases.

Now, first, I must explain that the estimation of the visional activity and the examination of the fundus of the native is beset with difficulties. To begin with it is almost impossible to make the native understand what is required of him, even if one has the assistance, as I had, of a most intelligent native interpreter. If one eye is covered he immediately closes the other, and, when induced to open it, persistently stares at the ceiling. The finger test, which was the only one found to be practicable, is only a rough one, for fingers can be counted by the normal eye at a distance of over one hundred yards.

The pupils in the native are very sluggish, and rarely give such marked indications of fundus disease as in the European.

In the ophthalmoscopic examinations I found that I had to depend entirely on the direct method. In many cases it was only with extreme difficulty and the exercise of a considerable amount of patience that an accurate ophthalmoscopic picture could be obtained, as the subject looking into the dark was quite blind and unable to fix his eye, so he promptly turned it up under the eyelid.

Again, the fundus picture in a native is different from that of a European. The whole fundus is of a dark slatey color, on which it is difficult to be certain of minor changes, and the disc stands out in the contrast like the moon on the dark background of the sky at night-time.

Realizing my difficulties, therefore, you will be prepared for the statement that an accurate examination such as would have been possible in white patients was impossible in these. The impracticability of taking perimetric charts was a great disappointment in the face of the paramount symptom from which they all suffered—that of night blindness.

Of the 63 cases examined 28 presented no intraocular changes whatever, but there was marked defect of vision. Four could count fingers at six yards; four could count fingers from a few inches up to two yards; and the remaining twenty varied from bare perception of light to capacity to recognize the hand held close to the face without being able to count the fingers.

Eleven out of the 63 showed distinct evidences of hyperemia of the papilla; of these two could count fingers at six yards, four up to two yards, four recognized hand movements, and one had only perception of light.

Of the remaining 24 cases, 13 presented the appearance of marked hyperemia of the disc with engorged retinal veins. The papilla was intensely red from the physiological cup to the margin; it had lost its normal translucency, but it was not swollen, and the margin was quite defined.

One of these was able to count fingers with the right eye at two yards, with the left at six yards; two counted fingers at two yards, and the rest had perception of light; two of the latter had lost perception of light in the right eye.

The last eleven cases require more detailed description.

1. Native *"Sekani."*—Blind 2½ months. V. R. counts fingers at 6 inches. V. L. counts fingers at 1 foot. Pupils very sluggish, but not dilated. By ophthalmoscope—Right eye: Optic disc inflamed and slightly swollen; margin indistinct with slightly striated appearance. Retinal vessels engorged, and on the surface of the disc obscured in places by inflammatory swelling. Left eye: Optic disc very hyperemic, but with a well-defined margin. Retinal vessels engorged. Slight effusion like a thin veil over the disc.

2. Native *"Fungulani."*—Blind two months. Pupils dilated and inactive. V. R. and L.: No perception of light. By ophthalmoscope—Both eyes: Optic disc inflamed, very ill-defined, and slightly swollen; margin quite indefinite. Optic disc covered with inflammatory material, obscuring the retinal vessels on its surface, and also for a small distance on to the retina. Some opacity of the posterior part of the vitreous.

3. Native *"Binga."*—Blind two weeks. Pupils very sluggish. V. R. and L., perception of light. By ophthalmoscope—Right eye: Normal. Left eye: Optic disc slightly inflamed, but margin fairly distinct. Retinal vessels very full and somewhat indistinct in parts of the optic disc, as if obscured by slight inflammatory effusion.

4. Native *"Juan."*—Suffering from slight nasal catarrh. Pupils normal. V. R. and L.: Counts fingers at two feet. By

ophthalmoscope—Right eye: Optic disc hyperemic, with engorged retinal veins; margin well defined. Left eye: Optic disc inflamed and slightly swollen, with indistinct and striated margin. Retinal vessels much engorged, and in places both on the surface of the optic disc and slightly beyond its margin they are quite obscured.

5. Native *"Alphas."*—Pupils quite inactive and dilated. V. R. counts fingers at six inches. V. L. sees fingers but cannot count them. By ophthalmoscope—Both eyes: Marked optic neuritis. The optic discs swollen and obscured by inflammatory material, which fills the porus opticus and completely covers the retinal vessels at their exit. The vessels bend sharply over the margin of the disc, which is characteristically striated. Retinal veins very much engorged. No hemorrhages or retinal effusions. This may be described as a moderate form of "choked disc."

6. Native *"Arfenali."*—Blind for four weeks. V. R. and L.: Perception of light; cannot count fingers. Pupils very sluggish and dilated. By ophthalmoscope—Right eye: Optic disc atrophied, of a dirty grey color, with organized inflammatory material filling up the physiological cup and obscuring the retinal vessels at their exit. Left eye: Optic disc much inflamed and swollen. Retinal vessels much engorged, and on the surface of the disc only small portions of the vessels can be seen.

7. Native *"Kashoti."*—Blind for two months. Pupils slightly dilated; no action to light. V. R. and L.: Perception of light; cannot count fingers. By ophthalmoscope—Right eye: Post-papillitic atrophy. Optic disc a dirty greyish white; lamina cribrosa cannot be seen; margin ill defined; retinal vessels very small. Left eye: Optic disc inflamed, but not swollen; margin very indistinct and striated; retinal vessels much engorged.

8. Native *"Chikopo."*—Blind three weeks. Pupils inactive and dilated. V. R. and L.: Perception of light; cannot count fingers. By ophthalmoscope—Right eye: Optic disc much inflamed and swollen; margin indefinable. Retinal vessels very full and obscured by inflammatory material. Left eye: Optic disc pale and atrophied; of a dirty grey color, with organized inflammatory material filling the physiological cup, obscuring the lamina cribrosa and the retinal vessels.

9. Native *"Jarvi."*—Unable to work for three weeks, owing to failing vision. Pupils dilated and quite inactive. R. and L.: Perception of light. By ophthalmoscope—Right eye: Optic disc hyperemic. Left eye: Grey atrophy of disc.

10. Native *"Juow."*—In hospital on arrival; returned to work underground and could see till three weeks ago. R. and L.: Cannot count fingers. Pupils dilated and sluggish. By ophthalmoscope—Discs very pale and vessels obscured on disc.

11. Native *"Louis."*—Sight failing four weeks. R. and L.: Count fingers at one foot. Pupils dilated and sluggish. By ophthalmoscope—Right eye: Post-papillitic atrophy. Porus opticus filled in, vessels obscured on disc, with organized inflammatory material. Margin ill defined. Left eye: Hyperemia.

An analysis of these cases presents several features of interest.

First, we find that out of 63 cases examined, 28 showed no pathological changes to be seen by the ophthalmoscope, and yet out of these 28 cases, the sight of 20 was so profoundly affected as to be reduced to mere perception of light or to the capacity to recognize the presence of an object held close to the face, and four more could only count fingers up to a distance of two yards. It is evident, therefore, that some considerable interruption to the conductivity of the optic nerve fibres must have taken place behind the eyeball, for there was no disease within the globe.

Secondly, the remaining 35 cases exhibited every gradation from simple hyperemia of the papilla to advanced papillitis and post-papillitic atrophy. But the loss of vision in these cases bears no relation to the amount of the fundus change. Thus we find absolute loss of sight in one eye in two cases of hyperemia, whereas in the native Alphas, who could fingers at six inches, there was marked optic neuritis, with a considerable amount of swelling. This bears out again what was said before, and the loss of vision must be accounted for by retrobulbar conditions, for it is common experience that inflammation and swelling of the papilla interferes as a rule only slightly with the conductivity of the optic nerve fibres. It is not till the commencement of the atrophic stage, in which the nutrition of the nerve fibres is interfered with, that the sight is deteriorated.

Thirdly. In no case was there any inflammation of the retina, except in the few instances in which the inflammatory process had extended from the papilla to a narrow zone of the retina immediately surrounding the disc. There were no patches of retinitis or chorioiditis; there were no changes at the yellow spot region, and no hemorrhages.

Fourthly. We must notice the length of time that had elapsed between the time of the original illness and the intraocular manifestations. These natives were taken ill during June and July, and yet in many cases eight months later there were no intraocular manifestations, and in several such manifestations were of the slightest character.

Fifthly, there is the evidence of contradiction of the field. I think that the evidence on this point is practically conclusive. It is extremely regrettable that it was impracticable to obtain perimetric charts, which would doubtless have been very instructive, but from general observations little doubt was left in my mind that considerable limitation of the field of vision was present in all these cases. They all complained that they were unable to see in the dark, which was proved to be a fact by the evidence of those who attempted to get them to work underground. Even those boys who had the best sight amongst them, those who were able to count fingers at a distance of six yards and possibly more, looked at the required objects with a curious screwing action of the head, as if trying to see down a tube—evidently an effort to get the image of the object accurately upon the yellow spot, the only useful portion of the retina to them. These natives when brought into a well-lighted room for the preliminary examination found their way in and out of same room with the blinds drawn, but not completely dark, stumbled about with hands extended, like blind men. I think there can be little doubt that all these cases belong to one group—an inflammation of the optic nerve, or descending neuritis.

It appears to me from a study of these cases that there are two or three points which require further consideration and elucidation. These are the nature and source of the inflammation affecting the nerves; the part of the nerve first affected, and the reason for the contraction of the field.

We have already seen how commonly the base of the brain was found in the autopsies in former epidemics to be bathed in pus, even when few cases presented any clinical signs pointing to implication of the cerebro-spinal system. Drs. Brodie, Hamilton, and Rogers have stated it as their opinion that this inflammation of the meninges is a direct extension from the pneumococcal rhinitis. To quote their own words, they say, "As a result of our examination we think the most usual course to the interior of the skull is from the muco-periosteum of the sphenoidal sinus to the sheaths of those nerves embedded in the wall of the cavernous sinus, and thence by direct extension to the arachnoid and pia mater. In other cases, undoubtedly the organism infects the meninges by extension along the nerves or vessels traversing the cribriform plate of the ethmoid; it has been shown that the nasal lymphatics are in communication with the subdural and subarachnoid spaces by means of perineural paths."

The purulent material from the meninges was examined microscopically and by cultures, and besides a large number of pneumococci, septic organisms were found, and the question arose as to whether these septic organisms were responsible, not for the original infection of the meninges, but for the formation of pus. However, it has been proved by experiments that the pneumococcus has pyogenetic qualities, and the same thing has been proved clinically as in cases of suppurative arthritis caused by the pneumococcus. Apparently, therefore, formation of pus may be directly due to the presence of the pneumococcus without the assistance of streptococci or staphylococci.

It is not difficult to follow the inflammatory process from the meninges of the brain to the optic nerve. The nerve is invested by a loose though strong fibrous sheath—the dural sheath—which is a direct extension from the dura mater of the brain, and which extends from the optic foramen to the sclerotic, with which it blends. Within the dural sheath and closely applied to the nerve is a more delicate sheath—the pial sheath—a direct extension of the pia mater, and ending anteriorly at the lamina cribrosa. This pial sheath sends down fine processes between the nerve bundles of the optic nerve, and these branch again, so that the whole framework of the nerve is an extension from the pial sheath.

Between these two investing membranes of the nerve is a space called the intervaginal space, which is in direct communication behind with the subarachnoid space, and terminates anteriorly at the scleral opening.

With this direct continuity of tissues and spaces, the way is made easy for an inflammation of the pia-arachnoid to travel downwards into the pial sheath and thence into the substance of the nerve. For a long time the puzzle that presented itself to pathologists was that apparently there was no sign of inflammation in the body of the nerve, whilst there were often all the appearances of acute inflammation of the papilla. Of late, however, more careful microscopic examination has demonstrated in the supposed healthy nerve a low form of inflammation extending from the pial sheath through the whole framework of the nerve, and accompanied by abundant proliferation of cells.

The immediate consequence of this microscopic demonstration was that Von Graefe's mechanical theory, amongst others, was abandoned, and we are now practically reduced to two theories—either that inflammation proceeds down the pial sheath and so sets up a low grade of neuritis, or, as Leber has suggested, that irritating particles passing from the subarachnoid space of the meninges into the intervaginal space of the nerve set up inflammatory processes. It appears to me that this latter theory does not fit in with the cases under consideration, for if the neuritis were set up by irritating particles in the intervaginal space, one would expect either that papillitis would be demonstrable much earlier than was the case, or that there would be more widespread inflammatory changes within the globe, for the intervaginal space, though it apparently terminates at the scleral opening, has been shown by injection experiments to continue by fine channels through the lamina cribrosa. Irritating particles in the fluid between the dural and pial sheaths would naturally pass freely to the inside of the globe, and would exert their irritating qualities wherever they went, and if the fluid were purulent it would be natural to expect a purulent chorioiditis, followed by purulent panophthalmitis. This is not the history of these cases in which visual acuity is much diminished for a considerable time before there are any intraocular changes, and this slow progress of the disease agrees with the other theory of inflammation by continuity of tissues.

But what about the limitation of the visual field? I think here again anatomy comes to our assistance. Disturbances of vision in optic neuritis are caused either by interference with the conductivity or by interference with the nutrition of the nerve fibres. The first is sometimes remediable if the cause of the interference is removed in time; the second is irremediable. The optic papilla may be extensively inflamed, and the vision is unaffected because the conductivity of the nerve fibres is not destroyed, the inflammatory material having plenty of room in which to expand without hampering the nerve fibres, but if atrophic changes begin the sight immediately responds. The conditions in the body of the nerve are quite different. We are dealing here with a structure that is permeated with fibrous tissue and in which a very slight amount of inflammation and cell proliferation must result in considerable pressure on the nerve fibres and consequent interference with their conductivity. And this, in fact, is what we do find, that interference with the vision is an early symptom; but why of the peripheral vision? The anatomical conditions of the optic nerve furnish a ready explanation. The central and most sensitive part of the retina is supplied by a distinct set of nerve fibres, which alone supply this region, and which can be tracked back through the body of the optic nerve as a distinct bundle of fibres —the papillo-macular bundle.

This bundle, immediately behind the papilla, lies ventro-laterally, and forms a keystone-shaped sector with its base towards the pial sheath and its apex towards the central vessels. Further back the bundle is half moon shaped, and still further back it takes an oval shape, and, dipping into the body of the nerve, approaches its axis. In the optic foramen this papillo-macular bundle, which is responsible for central vision, is in the centre of the optic nerve and furtherest removed from the inflammatory process which is commencing in the pial sheath and extending gradually down the length of the nerve and into its substance.

It is regrettable that no microscopic examination of the optic nerve in any of these cases has, for obvious reasons, been possible, but I think you will agree with me that they all belong to one group, that of a descending neuritis, an extension of inflammation from the pia-arachnoid invading the pial sheath, and the body of the nerve at the optic foramen, and gradually spreading down the nerve till the process can be seen in the optic papilla, and by similar degrees involving the axis of the nerve till the central visual acuity is destroyed.

Now, as to the cause for this inflammation of the optic nerve, I have little doubt that it is due to pneumococcal infection. It is very regrettable that no investigation was carried out during the epidemic of 1903, similar to that of 1898. If post mortem examinations had been made and the disease found to be pneumococcal, the chain of evidence would have been complete, but without that link the evidence is incomplete. I am, however, assured that the clinical features were so similar to those of former epidemics that no doubt was left in the mind of the medical attendant that he was dealing with the pneumococcus.

By what accident it should have happened that in this particular epidemic so many cases of failure of vision should have occurred, it is difficult to explain. None such have been recorded in previous epidemics, and yet many cases exhibit purulent meningitis post mortem. Dr. Brodie has, however, suggested a possible explanation. He thinks that probably such cases did occur, but were not recognized, and that natives recovering from the disease and being unable to work below the surface, though able to see in the daylight, may have been supposed to be malingerers, and as such would have been discharged by the compound manager without reference to the medical officer. It is not probable that the cause was meningococcal infection. Though several cases of cerebro-spinal meningitis have been seen on the Rand, it has never been demonstrated in epidemic form, and in those epidemics which have occurred in Europe and America, eye affections have included such conditions as retinitis, plastic and purulent iridochorioiditis. None of these conditions existed in this epidemic. It has been urged that the epidemic was one of influenza, but this is hardly tenable, for the ocular complications in influenza consist mostly of external inflammation of the eye and muscular troubles, and though cases of retro-bulbar optic neuritis have been put on record, they are so few in number as to be a negligable quantity.

I think, on the whole, though the evidence is incomplete, that I am justified in considering that the disease was of pneumococcal origin, and that the pneumococcus, though responsible for the inflammation of the meninges, was only in a secondary sense responsible for the inflammation of the optic nerve.

PYEMIA, ORBITAL CELLULITIS AND DEATH, FOLLOWING THE USE OF MESOTAN.*

By Edward B. Coburn, M. D.,

NEW YORK.

ASSISTANT SURGEON, CORNELL UNIVERSITY MEDICAL COLLEGE; ASSISTANT SURGEON AND PATHOLOGIST, NEW AMSTERDAM EYE AND EAR HOSPITAL.

A woman, aged 31, was admitted to Roosevelt Hospital, July 14th, 1904, complaining of pain in the back, great prostration and swelling of the right eye.

Her previous history was extremely good, as she said she "was always well." Her present illness was the culmination of troubles lasting over six months, during which time she had been subject to attacks of severe pain in the abdomen, not localized, and relieved by movement of the bowels. There was never any pain in the chest. Eleven days before she was admitted to the hospital she had severe pain in the lower part of the back. To relieve the pain she was advised to use Mesotan, which she rubbed on the affected part repeatedly, but whether the Mesotan was used full strength or diluted is not known. Her condition grew worse and she went to bed. Pains were felt all over the body, and for some time she could not move the left leg. Pain was also felt in the right side of the chest.

Four days later she had convulsions, arms and legs became rigid, but there were no chills and no cough. After the convulsions her right eye began to swell. She was also delirious at different times during this week. There was no pain at this time in her abdomen, but severe pains were felt in the back and other parts of the body. Fever was probably present. When admitted to the hospital her temperature was 104½°, pulse 128 and respiration 52. She complained of headache and at times pain in the lumbar region. Urinary analysis showed a faint trace of albumen, with a few faintly granular and coarsely granular casts. Examination of the blood showed the leucocytes to number 35,000, though later they dropped to 33,150. The clinical diagnosis was abscess of the back, with general pyemia.

I was called in consultation by Dr. Miller, the house surgeon, July 15th, and was told that the edema of the right eye had increased since her admission to the hospital. The eyelids were swollen, the conjunctiva chemotic and protruding between the lids; the eyeball was pushed forward and immovable, and the eyeball was stony hard. The pupil was dilated and unresponsive to light. Ophthalmoscopic examination of the fundus showed the veins greatly dilated, but otherwise the fundus was normal. The left eye was normal.

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*Read before the Ophthalmological Section of the New York Academy of Medicine, October 19th, 1905.

I made a diagnosis of orbital cellulitis (metastatic) and recommended hot boric acid applications to the lids, boric acid ointment to protect the cornea, and multiple incisions through the lids into the orbit to evacuate any pus which may have formed. These procedures were not carried out, as it was decided to operate on the back at once. Dr. Brewer made an exploration of the lumbar region and kidney, making the usual oblique incision six inches long in the right flank. The tissues were edematous and numerous small foci of pus were found rather superficially. No large abscess was found. The wound was closed with silk sutures, leaving space for drainage. The pus contained streptococci. The patient was given an infusion of 1,500 c.c. of normal saline solution on the operating table, and again some hours later. Her condition grew worse. Micturition and dejections were involuntary. She was semi-conscious and delirious all night. Her pulse became rapid and weak, and there were muscular twitchings of the right side. Just previous to her death, at 7:55 a. m., July 16th, her temperature was 120°, respiration 84, and pulse 175.

At the autopsy multiple small abscesses were found in the liver and kidney, and the anatomical diagnosis of pyemia was made.

The interesting feature of this case is the etiology.

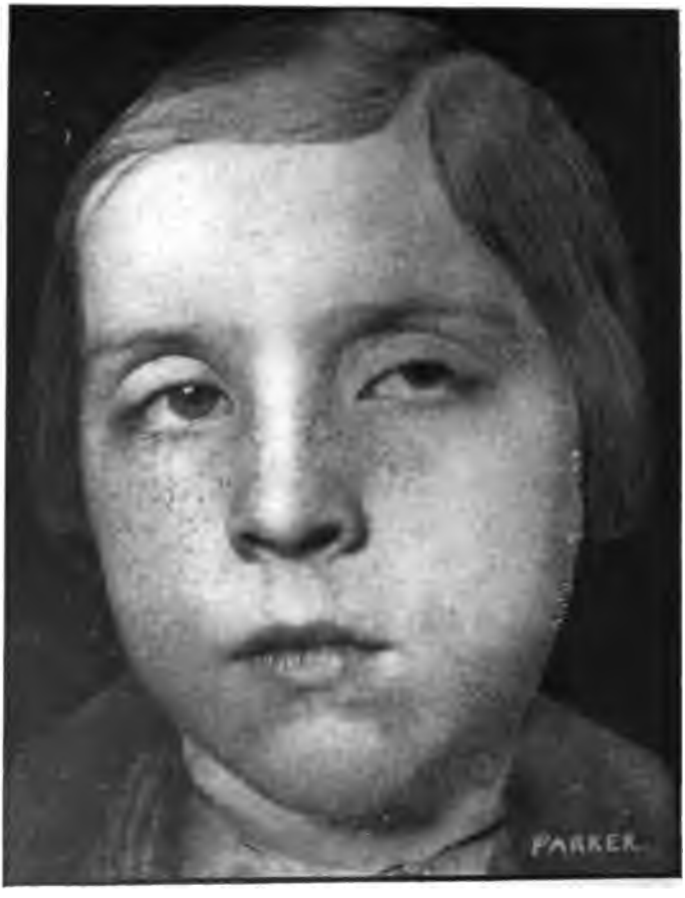
It seems very probable that the woman had some form of rheumatism, and for the relief of this she had applied Mesotan to the affected parts. Mesotan is a Methyl-oxy-methyl-ester of salicylic acid, and after the application to the skin is absorbed, breaks up into simpler chemical forms, and finally appears as salicylic acid in the urine. It is recommended for external use, diluted with olive oil, and should be brushed on, not rubbed in. It is a well known fact that the salicylates frequently cause erythema and vesicular eruption, and cases have been reported where severe localized vesiculation and a more general urticarial eruption have followed the topical use of Mesotan.

It is not known whether the patient used the Mesotan pure or diluted, but it is not difficult to believe that the woman either rubbed the Mesotan into the affected part, causing an abrasion of the surface, or that she had some idiosyncracy for the drug, resulting in a vesicular eruption, and that she became infected through the avenues thus opened. On the contrary, the abraded parts being covered with salicylic acid compound, and the antiseptic qualities of salicylic acid being well known, it is somewhat difficult to understand how infection could easily occur.

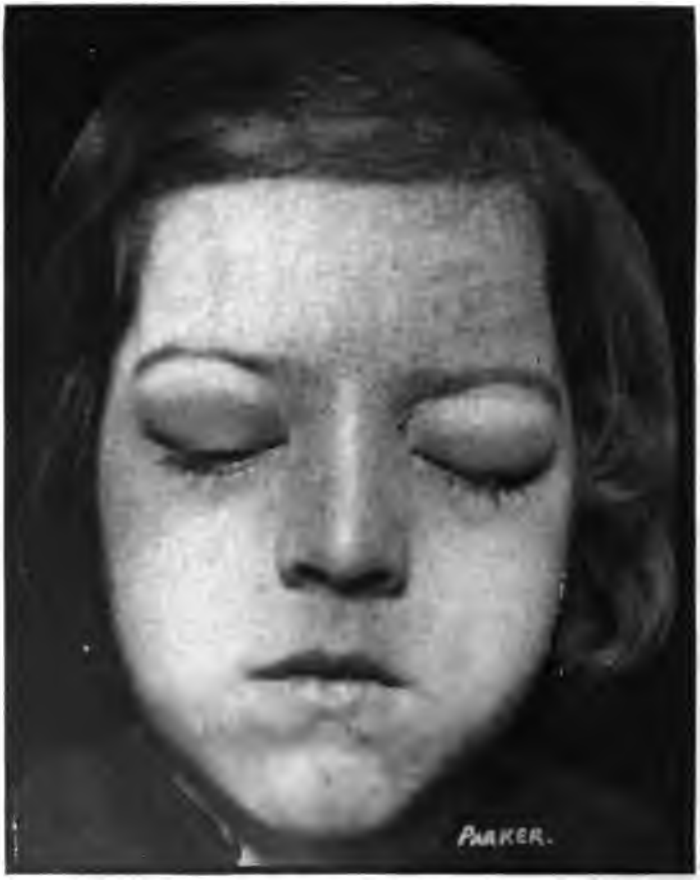
It is unfortunate that the head was not examined at the autopsy, but the process in the orbit was probably a metastatic abscess or cellulitis.

The lack of other pathological findings at the autopsy makes it difficult to account for her sufferings, lasting over six months, while the presence of small superficial abscesses seems to point to a local infection.

16 East Forty-third St., New York.



BILATERAL GUMMA OF THE ORBITS AFTER FIFTEEN MONTHS' ACTIVE TREATMENT WITH THE X-RAY AND INTERNAL MEDICATION.



BILATERAL GUMMA OF THE ORBITS SHOWING CONDITION OF THREE MONTHS' STANDING.

BILATERAL GUMMA OF THE ORBITS IN A CHILD EIGHT YEARS OF AGE.*

By Frank C. Parker, M. D.,

NORRISTOWN, PA.

ASSISTANT SURGEON, WILLS HOSPITAL; FELLOW OF THE COLLEGE OF PHYSICIANS, PHILADELPHIA; OPHTHALMOLOGIST, STATE HOSPITAL FOR THE INSANE, AND CHARITY HOSPITAL.

The case which I present this evening is one of bilateral, orbital growths, shown by pathologic findings to be a gumma, and occurring in a very young patient—a girl eight years of age.

The patient was brought to me for the first time on November 4th, 1904, with the following history:

Two months previous to the above date, the child's mother noticed the upper lid of the right eye becoming gradually swollen. Three weeks later the upper lid of the left eye began to present a similar appearance. The puffiness would be more marked in the early morning, rapidly decreasing an hour or so after arising.

At times the swollen lids would assume a purple tint, at others they would become reddened.

Headache increasing towards the end of the day, and at times very severe, was the only symptom complained of.

It was elicited that at the age of two years the patient had had an attack of tonsillitis, and that measles had occurred three times, during which attacks the eyes were swollen. One sister was living, and there was a history of one miscarriage at five months. No history-giving evidences of a marked specific taint could be elicited.

Vision was $^{5}/_{12}$ in either eye.

The upper lids of both eyes were greatly swollen, slightly reddened, and tense to the touch. Almost complete ptosis was present, and there was a marked limitation of upward movements of the eyes. In walking, the child held the head tilted backwards, peeping beneath the lids, which drooped below the pupils.

Beneath each orbital ridge could be felt a hard mass, immovable and simulating bony thickening; this appeared to be about five millimeters in thickness, and extended the full length of the superior orbital margin. At the upper-inner angle of the orbit it presented a somewhat more protuberant property, and resembled the hard, bony protrusion from frontal sinus disease.

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*Read by invitation before the Section of Ophthalmology, College of Physicians, Philadelphia, February 20th, 1906.

The pupils were fully dilated from atropin instilled by a colleague, otherwise the external appearances of the eyeballs were normal. The ophthalmoscope showed the media to be perfectly clear. There were no retinal or chorioidal lesions, and the optic nerves were healthy. The lowered visual acuity was accounted for by an hypermetropic astigmatism, which, when corrected, permitted normal vision.

Treatment was begun immediately, unguentum hydrarg. in half dram doses being administered night and morning. In addition, ten-minute exposures to the *x*-ray bi-weekly were given, the patient's face being covered with a lead shield, through which had been cut two cresentic openings similar in size and shape to the mass, allowing the rays to enter between the upper portion of the eyeballs and the roofs of the orbits.

The day following each exposure to the rays, the lids would be puffed out considerably and then resume their former state in about twenty-four hours.

Having noted this action of the rays, the exposures were cut down to five minutes.

One week after instituting treatment, the mercury was increased to dram doses, as the patient showed no ptyalism.

Three weeks later I had a consultation with Dr. W. C. Posey, who suggested a nasal examination. Accordingly, the patient was taken to Dr. Walter Freeman, who found a small adenoid, but no discharge from the sinuses. He thought the case might be one of orbital cellulitis, caused by infection through the nose.

Owing to the peculiar shape of the growth, it was a very difficult matter to determine whether or not the thickening beneath the orbital ridge was bony in nature. Consequently, various views of different ophthalmologists brought forth diagnoses of ethmoiditis, frontal sinusitis, orbital cellulitis, sarcoma, glioma, etc., the first three of these diagnoses being strengthened by the fact that the enlargement was bilateral and that the protrusion was more marked at the upper-inner angle of the orbit.

As the result of the diversity of opinion, and also to make a positive diagnosis, as glioma and sarcoma had to be taken into consideration, it was decided to excise a portion of the growth, or should the swelling be caused by sinus trouble, to incise and drain the cavity.

During the three weeks that had elapsed from the first examination, the swelling of the lids and the mass itself had increased perceptibly, being on a level with the frontal bone.

The patient was accordingly admitted to the hospital, where, with the assistance of Dr. Posey, I made an incision crescentic in shape, at the upper-inner angle of the orbit.

Cutting down upon the hard protuberance, a tough, gristly mass was encountered, protruding just beyond the orbital ridge and extending its whole length. The mass lay closely against the bone, but was found to be rather easily detachable.

Dissection was carried far back into the orbit, but the growth, as far as the finger could reach, had no point of attachment, entrance or exit to, into or from the orbital walls. Owing to the extensive spread of the growth, extirpation was impossible, without doing an entire exenteration of the orbit, but a large section was, however, removed, and a drainage tube inserted, the wound being closed by stitches.

The patient recovered rapidly and was discharged from the hospital nine days later.

A microscopic examination of the specimen was made by Dr. E. A. Shumway, whose report reads as follows:

"Dr. Allen Smith confirmed my diagnosis of syphilis (gumma) in the specimen submitted.

The sections showed marked vascular changes, endo- and perivasculitis, with marked proliferation and swelling of the endothelial cells, and in an artery an organising thrombus.

The majority of the cells infiltrating the tissue are small, mononuclear round cells—ordinary plasma cells—but there are a great many large, flat endothelial cells, such as are commonly found in gumma. The ordinary myxomatous reticulum which occurs in gumma is replaced by fibrous tissue here. The cellular infiltration is most intense, as you will notice, about the vessels.

"There is no necrosis, and no suggestion either of tuberculosis or sarcoma."

Treatment was now continued with unguentum hydrarg. in dram doses, night and morning, and *x*-ray exposures of five minutes each were given bi-weekly, a hard tube being used at a distance of 20 centimeters.

About two weeks later the swelling of the lids had not perceptibly changed. Potassium iodid was then added to the treatment, ten drops of a saturated solution being administered three times a day.

One week following the lids were greatly swollen and tense, the swelling extending up over the brows, and there was marked proptosis, this being more marked in the right eye. The temperature was 99° and the pulse 102. The patient complained of considerable pain.

Ophthalmoscopic examination showed a slight hyperemia of the discs, which was more pronounced in the right eye.

As the *x*-ray had been applied rather more vigorously the day previous, and as similar reaction had occurred in earlier employment of the rays, I attributed the condition to the latter.

The following day found the proptosis almost gone, and the patient out of bed of her own accord. The next day both eyes were in their accustomed position and no evidences of the trouble remained. Pulse and temperature were normal.

Active treatment was then resumed with the result that four days later iodism made its appearance, numerous red spots the size of a dime covering the body. The right eye was also proptosed slightly.

The iodid, which was now being taken in twenty-drop doses, was discontinued, and the eruption fast disappeared. Inunctions were continued and pushed to the extent of severe ptyalism, the patient being confined to bed for three weeks, during which time the tongue was swollen greatly and large sloughs were expelled from the mouth.

After recovery from this, the lid condition showed some improvement, though this apparent subsidence in the swelling may have been occasioned by the emaciated condition of the child, who could not take proper nourishment.

Treatment was again renewed with unguentum hydrarg. and ten-drop doses of potassium iodid. *X*-ray exposures were made twice a week.

The growth presented about the same appearance from month to month, until about three months previous to present writing, when the mass beneath the orbital ridge began to diminish in size. This improvement continued up to the present time, when no trace of the growth can be felt with the finger, and the palpebral fissures have widened to such an extent that the patient can walk with ease without holding her head in an unnatural position.

The upper lid margin of the right eye has raised to within two millimeters of the upper limbus, and that of the left approaches to within four millimeters, the difference being due, I think, to operative interference.

The upward movements of both eyes are good, though the right cannot be raised quite as far as the left. Diplopia cannot be elicited, and I might add that the patient is unusually observant for a child.

Owing to the fact that anti-syphilitic treatment had been pushed to the limit without marked results, and also taking into consideration that the *x*-ray did produce very noticeable reaction on the growth within a day or so following treatment, I think it fair to conclude that some of the improvement which has been noted in this case may be ascribed to the latter procedure.

REPORT OF A CASE OF HOMATROPIN POISONING.

By Samuel Horton Brown, M. D.,

PHILADELPHIA.

Instances of individual idiosyncrasy for certain drugs are by no means uncommon, and one hesitates to refer to an apparent poisoning case, lest he be merely unearthing one of these phenomena. However, a careful investigation has sufficed to prove, to my own satisfaction, at least, the uncommon nature of the condition I am about to relate.

The patient was a highly neurotic woman, suffering from the ordinary symptoms of eyestrain greatly exaggerated. I had had occasion to observe the profound emotional disturbance, the slightest abnormal physical condition would produce, on more than one occasion. In one instance, impacted cerumen in one ear had induced pseudo-epileptic attacks. With these facts in mind, I had determined to proceed most carefully in the examination of her condition of refraction. She being considerably under 45 years of age, homatropin hydrobromate was used, two drops of the solution being instilled in each eye at intervals of 15 minutes. The solution contained ten grains to the ounce of homatropin, and had been freshly prepared. The solution had been used upon other patients during the same office hours, with no bad effects.

Cycloplegia was readily produced within 45 minutes after the first instillation, but the patient became quiet and subdued, a condition diametrically opposed to her natural state. While performing the shadow test, the patient became pale, dizzy and fainted. Morphin was given to counteract the homatropin, but to little effect. Syncope passed off rather rapidly, and was succeeded by mild delirium and incoherent speech. The patient was, to all intents and purposes, intoxicated.

After a repose of about three-quarters of an hour, the patient was sent to her home, but on arriving there her conduct was such that it attracted considerable attention. Her speech was incoherent and her actions grotesque. While somewhat stupid, she was unable to go entirely to sleep. She experienced a peculiar sensation, which, according to her own expression, separated her from her own self.

The condition persisted in all its intensity for about twenty-four hours, during which period she was confined to the house, lest some harm would befall her. Mydriasis and cycloplegia were still present, and did not entirely disappear until the fifth day after the homatropin was instilled. At this time most of the mental effects had passed off, but the patient was much weakened and fatigued.

At a subsequent visit it was learned that the patient had been addicted to the use of morphin for quite a few years following some gynecological operation, but had not used the drug for some time previous to this reaction to homatropin. It was also learned that she was unusually susceptible to strychnin and belladonna.

CONGENITAL PIGMENTATION OF THE CORNEA.*

By A. Kraemer, M. D.,

SAN DIEGO.

Translated by Clarence Loeb, A. M., M. D.,

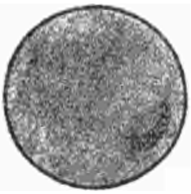
ST. LOUIS.

In the October, 1905, number of the *Centralblatt*, Steiner reported two cases of pigment spots in the cornea in a Javanese, and claims that these spots were congenital pigmentations.

He notes that such pigmentations of the cornea are very rare, even among the dark-brown inhibitants of Java, and doubts if they are ever found in white people.

The following observation will show that congenital pigment spots are found in the Germanic races also:

A short time ago, I was consulted by a man, 35 years of age, of German birth, with blond hair and clear, blue eyes. He stated that while at his work, chipping lead pipes, a foreign body flew into his right eye. His fellow workers tried to remove it, but did not succeed. On examination with a Hartnack's lens, no foreign body was to be found—not even an injury to the epithelium. On the conjunctiva of the upper lid, however, were three small, deep black bodies, after whose removal all complaint disappeared.



The following was noted as an accidental finding:

Above and outwards, about 1.5 mm. from the limbus, is seen a brown pigment spot in the cornea.

The spot was to be seen, even with the naked eye, being very distinct on account of the blue iris. It was 2.5 mm. long, and 1.5 mm. broad. Its upper end was broader than the lower. Its distal border was sharp, crescentic, and ran parallel to the limbus. (See figure.)

This spot lay in the upper layers of the cornea, and the epithelium over it was everywhere smooth and reflecting. Under the loupe, the spot was seen to be composed of fine, dark-brown pigment granules, lying very close to one another. No relation between the marginal vessels and the spot was found. Otherwise, the eye was entirely normal. No trachoma, no discoloration of the sclera or of the bulbar conjunctiva, no pigment anomalies in the fundus. RS., + Cyl. 0.50 axis perpendicular, = 1.5 (Landolt).

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*Translated from the Centralblatt fuer Praktische Augenheilkunde, Feb. 1906.

No analogous change was to be found in the left eye.

The diagnosis of congenital pigment spot was made by exclusion. On looking over more than thirty text books of recent date, including our large handbooks, I find that very few authors mention congenital pigmentation of the cornea.

Silex[1] writes: Pigment in the cornea is seldom congenital; it is found in negroes, in the epithelium of the border of the cornea. Congenital pigmentation of the cornea-melanosis, in white people, has been described in only a few cases. Both corneas were always symmetrical, most pronounced in the center, with a deep brown, spindle-shaped figure, which never caused any disturbances in vision.

De Schweinitz[2]: Congenital melanosis of the cornea may appear in the form of a vertically oval area of brownish color, in the center of this membrane. It has been ascribed to an abnormal development of the uveal tract. (Krukenberg.)

Ball[3] says: Kayser saw a case with congenital green coloration of the periphery of the cornea.

In his description of congenital defects of the eye, Van Duyse[4] has the following to say:

We can distinguish between a melanosis of the superficial layers, such as Westhoff describes, and a melanosis of the deeper layers, such as in the case described by Krukenberg[5]. In three cases, he noted by oblique illumination: Cornea of a brown color, found in the middle layers; pigment arranged in the form of a vertical oval, deepest in the center, lying in the deepest portion (Westien-Zehender loupe). No adhesions or precipitates in connection with the iris. Agreement in the color of the stroma iridis and the pigment of the cornea. Genesis: When the pupillary membrane was contiguous with the cornea, the pigment was fused into the cornea. (Krukenberg.) It is surprising that remnants of the pupillary membrane were not found in the intact area of the pupil.

That is all that I found in literature in regard to congenital pigment spots in the cornea. The literature concerning congenital pigmentation of the conjunctiva, sclera and optic nerve has been collected by Van Duyse in the Encyclopedie Francaise d'Opthal., Vol. II, p. 587.

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[1] Encyklopadie der Augenheilkunde, Lief. 9, p. 390.

[2] Diseases of the Eye. 4. Ed. 1903, p. 326.

[3] Ball, Modern Ophthalmology, 1904, p. 304.

[4] Encyclopedie Francaise d'Ophtalmologie, Vol. II, p. 373.

[5] Krukenberg, Beiderseitige Angeb. Melanose der Hornhaut. Klin. Monatsblatt f. Augenheilk. Bd. XXXII, p. 254, and Weitere Mitteilung uber Angeb. Doppelseitige Melanose der Hornhaut. Eben. 1899, p. 478.

If the hypothesis of the origin of the typical corneal melanosis is the correct one, which seems to be the case[6], the genesis of the pigment spots in the upper corneal layers must be a different one.

I consider these superficial pigment places as analogous to the pigment spots in the disc, lying close to the border of the sheath of the optic nerve, which were discussed thoroughly in a recent work by Oganea[7] (under Prof. Greeff's direction).

It was a congenital displacement of uveal pigment.

I do not believe that the observation of Westhoff[8] can be quoted as a case of congenital corneal pigmentation, but Van Duyse's can. This case was an old man, whose conjunctiva bulbi in the region of the palpebral fissure was colored bluish-black. This pigmentation extended on to the cornea, so that the arcus senilis and the epithelium of the cornea seemed pigmented a diffuse brown.

In the superficial and deep pigmentation, it cannot always be absolutely denied that it took place later in life, by wandering of the pigment (via the lymph channels), following some trauma, which may have escaped our notice, or following some old inflammation, etc. At the time of the examination, every trace of the preceding disease may have disappeared. V. Hippel[9] has shown, experimentally, that the endothelium of the cornea has phagocytitic powers, *i. e.*, is able to take up detached pigment from the iris and ciliary body.

I shall not enter into a discussion of the numerous methods of origin of acquired pigmentation of the cornea. They are well known, and have for the most part been discussed pathologico-anatomically. References: Ginsberg: Grundriss der Patholog. Histologie des Auges, 1903, S. 128; Herbert Parsons:

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[6] In an additional study of melanosis corneae, in the light of Krukenberg's theory, consideration must be paid to the relation to the membrana pupillaris persistens corneae adherens, although certainly a part of the condition considered under this head cannot be considered as an anomaly of development in the strictest sense. (v. Hippel, Graefe-Saemisch, II. Auf.) See also Gesang, Beitrage zur Augenheilkunde von Deutschmann, 1904, H. 60; also a new work of v. Hippel, Membrana pupillaris persistens corneae adhaerens. Graefe's Archiv. fur Ophthalmologie, Bd. LX, H. 3, S. 444. 1905.

[7] Ueber Pigmentierung des Sehnerven. Arch. f. Augenheilk. Bd. LII, S. 437.

[8] Westhoff, Pigmentation der Conjunctiva. Centralb. f. Augenheilk., 1899, August.

[9] v. Hippel, Zur Pathologie der Hornhautendothels. Bericht ueber die 29. Versammlung der Ophthalmologic Gesellschaft, Heidelberg, 1901.

The Pathology of the Eye, Vol. I, p. 249; Greeff: Lehr. der path. Anatomie v. Orth., 9 lief. H. I. S. 175, etc.; Zehender: Hand. der ges. Augenheilk. Bd. I, (1874), S. 240; Oeller, J.: Uber erworbene Pigmentflecke der hinteren Hornhautwand (mit abbildung). Arch. f. Augenheilk. Bd. XLVIII. H. 4, 1903.

There is one questionable method of acquiring pigmentation of the cornea, which I should like to mention.

We find in Gibbons[10] the following statement: "We occasionally meet with pigmented opacities of the cornea, etc. Black and yellowish discoloration of the corneal opacities are found in cases following aspergillus keratitis—the black spot caused by aspergillus niger, and the yellow by the aspergillus fumigatus."

The aspergillus niger has not been considered for a long time, as the cause of a mycotic keratitis in man, and that the scar after an infection with aspergillus fumigatus, has any special yellow tinge, is nowhere mentioned in the exhaustive work on aspergillus disease of the cornea by Lewin and Guillery.[11] See also Morax[12], in the latest work on the Disease of the Cornea.

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[10] Gibbons: The Eye, Its Refraction and Diseases, 1905, Vol. II, p. 332.

[11] Lewin and Guillery: Die Wirkungen von Arzneimitteln und Giften auf das Auge. Bd. II.

[12] Morax: Maladies de la Cornee. (Keratomycose aspergillaire). Encyclopedie Francaise d'Ophtalmologie, T. V.

ADDITIONAL INFORMATION CONCERNING CREDE"S SILVER THERAPY IN DISEASES OF THE EYES.*

By Marine-Oberstabsartz Dr. Meyer.

TSINGTAU.

Translated by Clarence Loeb, A. M., M. D.,

ST. LOUIS.

In the February, 1903, number of the *Centralblatt*, appeared an article by me on the value of silver therapy in eye affections. Even at that time, I was able to come to certain conclusions, but I must confess that the results of the last two years have brought about certain modifications, that I desire to communicate to the readers of this journal.

Since I started to practice in Tsingtau, I have had a large number of Chinese as patients. They came usually to the governmental policlinics and the missionary hospitals. This was due, on the one hand, to the great prevalence of eye diseases among these Chinese, and on the other to the good results of the Germans in this specialty, which has helped to produce a confidence in foreign physicians among the Chinese, who, as a rule, distrust them.

The Chinese in the vicinity of Shantung suffer especially from two kinds of eye diseases, viz., purulent conjunctivitis and trachoma. These are the results of uncleanliness, especially among the lower classes. In the villages and cities, the children run naked in summer, and in winter are clothed in many woolen garments, which are not laid aside until the winter storms have passed. There is the closest companionship with domestic animals, the dogs, cattle and beasts of burden. They are badly washed, or not at all. The nasal secretions run down over the mouth, and the region of the mouth and nose is covered with a dried secretion of dust and food remnants, which, in summer, is the resting place of flies, which impartially infest the rich dunghills, homes of the people, the unsanitary streets, animals and man. These conditions sufficiently explain the presence of so many discharging eyes in people of all ages, so many cases of uni- and bilateral blindness, so many people with leucoma, staphyloma, phthisical bulb, corneal pannus, corneal ulcers, huge pterygia, and malposition of the lids.

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These are the conditions most frequently found in the polyclinics and hospitals. The acute cases are more often conjunctivitis than trachoma. This observation agrees with the fact that trachoma is also much less frequent than the above diseases among the whites, corresponding to the frequency of intercourse between the Europeans and Chinese, both within and without the house.

The therapy employed was essentially antiseptic. For treatment, I used, as at home, the finest itrol for dusting, with or without a moist dressing; if possible, residence in a dark room also. The results were very indifferent; the conjunctivæ became clean either not at all or very slowly. The disease did not get well, the patient became distrustful, and did not return; partially, also, because the treatment caused them pain, for the Chinese, according to my experience, others to the contrary notwithstanding, are very sensitive to pain, but can control themselves better than the nervous Europeans. Since the lack of results with itrol did not correspond to my previous experiences, I concluded the drug was inefficient. It decomposed here too rapidly.

A drug which must be treated like a photographic plate, and which can stand neither light nor moisture, is not suited for this region. It is sufficient to mention the fact that during the rainy season, from June to September, the rooms must be warmed, in spite of the high degree of heat, in order to keep down rust and mould, and in order to have dry beds at night. In such a climate, itrol spoils even after opening the bottle only once, in spite of all care. I consider itrol to be a drug unsuited for this climate, in spite of all precautions, as is shown by bad results.

In its place I have taken collargol, which seems to me to be of inestimable value for this climate. Moisture has no effect on it, since it is a solution, and I protect it from the light by keeping it in a brownish-black bottle, in a dark closet, and darken the room before I use it. In this way the solution retains its dark-brown color, with the metallic luster on the cork.

I used it usually in a 5 per cent. solution, which is the strongest solution. The therapeutic results changed at once. Acute and chronic inflammations of the conjunctiva, even gonorrheal, became better, the swelling disappeared, the conjunctiva became pale and smooth, the irritation receded, and the ulcers of the cornea became clean. The method of use was simple instillation, accompanied by gentle massage. With the head in a lying position, and with the eye directed somewhat nasally, I separated the lids as far as possible and filled the sac with the solution. Then for 1 to 2 minutes, I moved the lids up and down, having intelligent patients roll the eyeballs at the same time. In this way, I was certain that every part of the sac was reached by the solution. Finally, I had the eyes gently closed, and covered with a light gauze-adhesive-plaster bandage. This process was usually repeated three times a day. I did not use a collargol stick, since all parts of the conjunctiva cannot be as easily reached in this way. Even at the end of three to four days, the secretion was usually so well checked, that I could use weaker solutions, 1 to 2 per cent., and could leave off the bandage. When the disease had entirely ceased, I finished the after treatment with the usual astringents. In this way, I was able to cure all cases of conjunctivitis, and am convinced that concentrated collargol solution is a sovereign remedy. The treatment is simple and easy, adapted to every climate, and therefore more convenient than itrol, and at the same time less painful.

I have no experience with the prophylactic treatment of the new-born, as there is no opportunity here for it. I am convinced, however, that collargol instillations will give results which are brilliant and without danger. The purulent conjunctivitis of nurslings is easily controlled.

In acute trachoma, I usually removed the follicle by the bloody method, finishing with the collargol massage with the 5 per cent. solution. Only after the secretion has entirely ceased, do I massage with copper citrate salve. In chronic trachoma, and in follicular catarrh, I also cure the secretion by the collargol massage before I use the copper salve.

Fresh ulcers of the cornea are rare here, for the Chinese comes to the European doctor only after he has been under treatment by a Chinese doctor, and has become anxious on account of great loss of sight or persistent pain. Therefore there is usually a high degree of infiltration and destruction of the cornea, perforation and synechia, where the knife and cautery alone are of any avail. In a few acute corneal ulcers I have achieved cure by the collargol solution, in some cases of long standing, aided by the cautery. At least, since using this method, I have never had a case of hypopyon. I add atropin to the solution *pro re nata.*

The operations were chiefly for trichiasis, entropion, pterygium, and leucoma, all sequelæ of the conjunctival and corneal inflammations that had lasted for years and decades. Ectropion was rarer than entropion. During the operations, the cartilages of the lids showed all stages of degeneration. It was best to remove them, since they furnished no support for the lids in their correct positions. The pterygia were at least as often bilateral as unilateral. They grew towards each other, and usually covered the cornea with a fibrous, vascularised, opaque membrane. Vision after the operation was usually satisfactory. Iridectomies were often necessary in leucoma. It was tried wherever there was a transparent piece of cornea near the border. It was easy to persuade the patient to submit to the operation, by his hope of seeing again. Unfortunately, the result was not always what was wished. This was influenced often by changes within the eye, that could not be determined beforehand. Cataract operations come seldom to the European physician, less often than would be supposed, considering the number of cataracts. This is due to the good results of the Chinese. Strabismus operations are very rare. The reason that there are so few strabismic Chinese is due, I think, to the fact that the Chinese suffer less from errors of refraction than do the Europeans. Many wear glasses, which are very noticeable on account of the large frames, but they are worn more out of vanity than necessity, also to give the wearer a learned appearance. Therefore they wear window glasses, especially colored ones, rather than refractive ones. On the other hand, it is difficult to get an enucleation. The Chinese think the foreign physician wishes to make drugs out of his bulb, and is afraid he must go without his eye in paradise. I have never been able to persuade a Chinaman to allow his eye to be removed. Usually, the simple statement is sufficient to cause him to disappear, never to return. On the other hand, he is very willing to allow evisceration.

In this operation, I used collargol for preliminary disinfection, and for after treatment, and obtained good results. I did have some suppurating stitch canals, which should cause no wonder, on account of the extreme dirtiness of the wound, but the suppuration always remained local, and did not disturb the final result. An infection of the bulb never followed one of my operations. Before the operation, I disinfected the conjunctival sac by dropping a 5 per cent. solution of collargol in it several times a day for several days, and bandaged the eye meanwhile with gauze wet with collargol. Thereby, I prevented trouble from the lacrimal sac.

In acute trauma of the eye, I was likewise able to prevent a general infection of the bulb. Whenever the patient came with a well developed panophthalmitis, the collargol was no longer of avail. The silver did not exert its action on an organ whose paths of nourishment were already involved.

In those cases where the vitreous was involved, no result was obtained, even from intravenous injections, or cutaneous or rectal exhibition of silver. I have continued the experiments on rabbits, which I reported in the July, 1903, number of the *Centralblatt*, but have confirmed the fear that I expressed in regard to the hay-bacillus, and have not confirmed the hope in regard to other agents of vitreal infection. In acute infections of the vitreous, however, with pneumococci, staphylococci, and hay-bacilli, I was able to retard the spread of the infection, but not to overcome it. The organ gradually became phthisical on account of panophthalmitis. Therefore, in panophthalmitis due to trauma, I confined myself to the external collargol treatment, and never saw an extension of the process to a neighboring organ. A good influence was observed on the swelling of the lids and the chemosis of the conjunctiva, accompanied by a diminution of the subjective complaint.

Lately, I have given collargol internally in ½ per cent. solution, one teaspoonful every one-half hour. That the silver enters the blood current is shown by the metallic taste of the saliva, which appears after several days' treatment. My idea is thereby to make the tissues near the eye, which are still well nourished, more capable of preventing the extension of the morbid process. The collargol may be used for weeks without complaint or disagreeable effects, and is best taken in tea, which thereby acquires a slightly seedy taste.

I have heretofore refrained from injecting collargol directly into the infected vitreous. I expect results from this only in acute cases, which we very rarely see here. Whatever success could be obtained is counterbalanced by the danger of making the vitreous opaque by the black coloring matter, and thus destroying the vision. We must first find out by experiments on animals whether this black color gradually disappears by resorption, but I do not expect much success. Every infection and its sequelæ injures the resorptive power. Nevertheless, it might be worth while to retain the form of the eye, and not allow it to be destroyed by the suppuration.

When I think of the astringent value of collargol, in addition to its internal and external value, I cannot refrain from giving it the first place in my armamentarium. By its absolute lack of danger, it gives me a feeling of safety, that I have never felt towards other disinfectants. That under conditions at home it may be replaced by itrol, which can be made daily and which suffers less there, I will not deny, on account of previous experiences. Still, itrol must be kept from light and air, and has lost effectiveness often before it is apparently altered. In collargol, however, we possess an ophthalmic drug which is certain in proper cases, and which keeps in every climate.

THE SCIENCE OF PARADOXIC LID-MOTION.*

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Up to the present time none of the past observers has succeeded in clearly establishing, indisputably, the genesis of the anomaly here under consideration.

In fact, we meet here with important difficulties on account of our inadequate knowledge of the anatomy and physiology of the brain. Much as the investigations of recent years may have achieved in contributing to our knowledge of the nature of the structure and connections of the central nerve organs of the eye, especially the experimental work of Bernheimer,[1] it is still insufficient therewith to comprehend pathological processes of an association of muscles otherwise apparently unassociated. As Lindenmeyer[2] asserts, we are dependent upon the fortunate circumstance of obtaining an autopsy of a case of this nature. This, it is true, would solve much.

For the present, it might be proper to report each case of paradoxic lid-motion.

CASE HISTORY.

The case of the Royal Eye Clinic is as follows:

Therese H., æt. 27, farmer's daughter.

Two and one-half years ago the patient was admitted into the clinic on account of a suppurating corneal ulcer with a large hypopyon. Fourteen days previous she was reported to have received an injury on hay scales. Besides this ulcer, there was evident loss of sensation of the cornea, the forehead and eyelids, at the time of admittance. All else was normal. The ulcer perforated and healed, leaving a dense opacity covering most of the cornea with continuous synechia with the iris.

A year and a half ago the patient became paralyzed, affecting the entire left side, including the facialis and eye musculature. After one-half year's confinement in the hospital, there was marked improvement, so that patient could walk alone. The ptosis, as reported, had entirely disappeared. Soon after, however, there appeared in the right eye a ptosis constantly progressing during eight days. Since this time (one year) there has been no material change.

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*Beitraege zur Augenheilkunde, 65. Heft, 1906.

OBJECTIVE EXAMINATION.

Right Eye: Besides leucoma corneæ, there exists a complete ptosis, paralysis of rectus internus, superior and inferior muscles, slight insufficiency of rectus internus. The eye is in an abducted position. Pupil not visible on account of opacity of cornea.

Left Eye: Lids have free motion. Rectus externus and internus somewhat insufficient. Rectus superior totally paralyzed. Rectus inferior is slightly paretic. Pupil medium in size and does not react to light, but reacts well on convergence and accommodation. Eye-grounds negative.

Vision = $^5/_{7.5}$ part.; with cyl. — 1.00 D. ax. horizontal = $^5/_5$.

Reads Nieden 1 at 10-35 cm.

Besides these eye symptoms there is a slight drooping of the angle of the mouth on the left side. The other branches of the facialis, as well as the remaining cranial nerves, are undisturbed. The mind seems slightly affected (according to report). Objectively, there is only observable a tendency to unmotived mirth during examination.

Patient's answers are rational and the succession of the various symptoms of her disease she gives promptly and systematically.

Now, the singular feature of the case exists in the fact, that, *whenever the patient looks to the right, the right paretic lid is energetically and completely elevated, in which act the frontalis does not participate;* it presents rather more an operation of a purely levator act. This phenomenon does not occur with other motions of the eye or face.

We have, therefore, under consideration, an acquired bilateral oculo-motor paresis, of which the right side is quite complete, and the left partial, which paralysis seems to be combined with a striking anomalous motion, also acquired. In the following we speak only of lid-phenomena as combined with eye motions.

These may be divided into several groups, according to their etiology or form of appearance, as raising or lowering.

If we consider alone the congenital cases, we find that these existed mostly without paralysis.

To this class belong Philipps's[3] two cases, in which, on contraction of the left rectus internus a lowering of the lid of the same eye followed. Again, Browning's[4] patient, on the contrary, being bilateral, an elevating of the same lid followed upon internus contraction with synchronous lowering of the opposite lid, but, upon convergence, both lids were raised. Pflueger[5] gave a short report of an eighteen-year-old girl in whom the right lid drooped when the eyes were turned to the right, but raised when the eyes were turned to the left. In the fourth case reported by Fuchs[6] convergence was followed by an outer oculo-motor paralysis on the right, accompanied with sphincter paralysis and raising of the paretic upper lid, as well as pupil contraction of the same eye. In the sixth case of the same author there was no paresis, but a drooping of the right upper lid on convergence. The cases of Friedenwald[7], Nos. 1 and 2 of the year 1893, and later No. 5 in 1896, belong also to this class, and will receive special attention below. Sinclair's[8] ninth case, of which I could not procure the original report, seem also to be congenital. Nos. 1-4 were not paralytic, and presented bilateral elevating of the lids upon contraction of the rectus internus of the same eye. In No. 5 to No. 9, inclusive, there existed unilateral paresis of the internus, and upon attempt to overcome the paralysis, a marked sinking of the same lid occurred, with simultaneous retraction of the entire bulb. Also in the case of Mr. Brixa,[9] æt. 27, without paralysis, turning the eyes to the right and left, and upon convergence lid elevation followed.

With this class of congenital cases of lid-phenomena, all previously observed cases in which no lesions existed are included, with a single exception of one of Pick's[10] cases, in which the manifestations could not be absolutely established as congenital; in this case the lids which were already abnormally elevated, would raise higher upon the depression of the eye. There existed in this case hysterical stigmata and Pick considered the anomaly due to spasms.

All patients in whom this manifestation was really acquired, exhibited more or less paralysis.

In case 1 of Fuchs (l. c.), all the external muscles of the left eye supplied by the oculo-motor nerve were paralyzed. Strong convergence was followed by elevation of the paretic eyelid. In case 2 there was light paresis of the right superior rectus and internus, and complete paralysis of the levator. Fixation of the right eye, contraction of the superior and internal rectus, was followed by elevation of the lid. Upon abduction the lid would depress, accompanied with pupil disturbances. Case 3 had complete oculo-motor paralysis of the left eye. Elevation of the affected lid followed spontaneously and rhythmically twice per minute with simultaneous pupil contraction when the eye turned to the light. In case 5, as in case 3, there was also complete paralysis of the oculo-motor. Lid elevation occurred when the eye was turned to the right and slightly upwards; also pupil disturbance. Case 7 falls also under this class and will receive closer consideration presently. In case 8 we have a complication of bilateral externus paresis and light indications of levator paresis, and when the patient turned her eyes to the left, both lids depress 2 mm.

Friedenwald's (l. c.) cases 4 and 6 belong likewise to this class and deserve mention. Case 7 had bilateral paralysis of the internus and superior rectus and trochlearis. Upon directing the look to the right, the right upper lid depressed; when looking in the opposite direction, the left upper lid depressed, but this latter was accompanied by a super-normal elevation of the right lid.

Brixa (l.c.) describes, besides one formerly mentioned, a case of right oculo-motor paralysis, including all branches of that nerve, in which elevation of the paretic eyelid occurred when the eyes were turned to the left.

Parinaud's[11] patient with bilateral paralysis not affecting the upper lid presented the phenomenon of a super-normal lid elevation.

The three cases of Wilbrand and Saenger[12] belong also to this class. Nos. 1 and 2 will be compared below with our case. No. 3 presented paralysis of all external muscles of the eye (including the superior oblique) and downward vision (subduction) was followed by elevation of the drooping lid.

In the patient of Drooglever-Fortuyn,[13] who had complete left oculo-motor paralysis, the ptosis disappeared upon casting the eyes inward, downward, and down and inward.

Likewise were the six cases of Hinkel[14] affected with complete unilateral paralysis of the third cranial nerve. In cases 1 and 5, elevation of the paretic eyelid occurred in the same manner as in the above cited case, except that there was more lid-drooping when the eye was turned outward. This last symptom was absent in case 6, in which there was paralysis of the externus.

We must further mention the female patient of Lindenmeyer (l. c.), who had more or less developed paresis of the levator, rectus superior, rectus inferior, and rectus internus. Casting the eyes to the left provoked elevation of the lid, but drooped more by reversing the position of the eyes to the left. Upon subduction, the eye followed to return immediately in a twitching manner.

The last cases of this class were published by Blaschek.[15] In case 1, woman, æt. 26, there existed for a period of a year, an incomplete paralysis of the levator of the left eye, rectus superior, rectus inferior, and rectus internus, apparently probably resulting from lues of hereditary nature. From the time the ptosis began to recover there appeared elevation of both upper lids when vision was directed to the right, and when directed to the left a deeper ptosis occurred. Upon elevation as well as by depression of the eyes, the left palpebral fissure widened. Besides this there was left internal oculo-motor paralysis. In case 2, (also female, married, æt. 26), with acquired lues, all the muscles supplied by the oculo-motor nerve on the right side had been for seven years in a high degree paretic, including the superior oblique. From the time the ptosis has been improving (two years) there has been marked elevation of the drooping lid, when vision was directed to the left and marked drooping followed the turning of the eyes to the right, and there was also elevation upon subduction of the eyes. Further, there were disturbances affecting the first, fifth, seventh, eighth, ninth and twelfth cranial nerves, and the first and second cervical nerves.

Comparing now our case mentioned in the introduction, with the others, we must first take into consideration those in which abduction of the bulb was accompanied by elevation of the lid affected with ptosis.

To begin with, we shall consider here case 7 of Fuchs (l. c.). This patient was an officer, æt. 45. At first there appeared light paresis of the levator, rectus internus, the accommodation and convergence of the right eye. After recovery of the paralysis, there occurred precisely the same manifestations with the left eye, with the addition that the left upper lid drooped when the eyes were directed to the right, but upon abduction the lid raised. The phenomenon remained only as long as the ptosis existed, and disappeared upon recovery of the latter. After a year's lapse there remained only some paralysis of convergence with anisocoria, bilateral pupil immobility and accommodation paralysis.

What further developments occurred in our case I cannot state, having lost track of the patient, and for this reason must drop this part of the comparison; in regard, however, as to the nature and manner in which the lid phenomena developed, there exists a remarkable similarity between Fuchs's seventh case and ours. In the latter, as well as the former, an oculo-motor paralysis of one side appeared, which in Fuchs's case completely recovered, and in ours partially, before the paralysis and lid phenomenon developed on the other side. In the case of Fuchs, the paralysis, including the ptosis, was incomplete, in ours complete. This explains in the Fuchs case the possibility of a deeper ptosis upon abduction, which (abduction) was not possible in our case. Pupil disturbance existed in both cases, only, in our case, in opposition to Fuchs, convergence, reaction and accommodation were undisturbed, of course, only observable on the left eye. Another point of quite material difference in the two cases existed in the behavior of the external rectus; while Fuchs does not mention any paralysis here, there existed in our case decided insufficiency.

Further analogies are observable in the publications of Friedenwald (l. c.). Cases 1 and 2 were girls, æt. 11 and 17 respectively. In both there existed a congenital paralysis of the left externus. In attempting to cast the eyes outward, the left upper eyelid was elevated higher than normal, but upon inward looking the lid moved down. The elevation of the lid accompaning abduction here only corresponds with our case; in all other respects it differs, *e. g.*, the ptosis is absent and the anomaly is entirely congenital. In case 3, girl, æt. 10, the anomaly is also congenital, but in this case there was besides paralysis of the right externus, a light paresis of the internus. Likewise, was there more marked elevation following abduction, and slight depression of the upper lid upon abduction, but, turning the eyes downward at the same time, it augmented the manifestations still more. There was also slight enophthalmos, which increased with abduction. No. 4 is also analogous to the two first cases (girl, æt. 20), only it seems that the lid depression with abduction was absent. The paralysis of the externus in this case was a sequence of an attack of paralysis at the age of five. In case 5, male, æt. 19, there was congenital, bilateral paralysis of the rectus internus and externus, and the elevation of the lid of the left eye occurred by turning the eyes outward, as did our case. Case 6, æt. 59, bears much similarity to cases 1, 2, and 4. In this case there was externus paralysis of the externus on left side, and lid-elevation with attempt at abduction. On the left orbital margin were visible cicatrices, results of an injury sustained at the age of two by a fall.

The patient of Brixa, æt. 27, (case 2, l. c.), manifested the symptom of lid-elevation congenitally, when the eye turned both to the right and left, and also upon convergence, though without any paralysis whatsoever. There were further observable the following anomalous movements: With subduction the upper lid remained stationary; when vision was directed upwards the lid first elevated, and only after some time the bulb would follow. In this case, only the lid-elevation accompanying abduction is analogous to our case; otherwise the case is principally different inasmuch as there is absence of paralysis, it being also congenital.

In the two cases of Wilbrand-Saenger (l. c.) we have only conditional parallelism with our case, in regard to lid-elevation accompanying the attempt at abduction. In case 1 (male, æt. 28), there was only on the left side levator and internus paresis. Vision directed to the left was accompanied with elevation of the left upper lid, while the right lid depressed. Later the right levator became affected by the paralysis. Directing the eyes to the right resulted in elevating the right lid and depressing the left. In this case, which terminated fatally, the manifestations followed tubercular meningitis. In case 2 there was paralysis of the externus on the left side. The attempt at abduction was followed by marked elevation of the upper lid above the normal position. The patient had passed through a course of lues three years previous, and now there appeared symptoms of brain tumor, such as raging headaches, stupor, epileptiform attacks, bilateral neuritis optica, keratitis neuro-paralytica of right eye, dizziness, tremor of hands and ataxia of legs. The lid-phenomenon appeared after the reconvalescence. As in our case, the two observations indicate lid elevation of the same side when the eyes were directed outward. There is, however, a difference between this case and the others belonging to this class, in this particular, that here with the lid-elevation the eyebrow (same side) also raised, which at least indicates an involvement of the frontalis muscle, while in our case, as well as the others here observed, (occasionally especially emphasized), it was purely a levator effect.

From this short analysis of the literature at our disposal, it is clear in what almost confusing manifoldness this manifestation, which we seek to elucidate, can arise. It may be stated that the movements of the eyeballs to one or the other side are a much greater factor in producing paradoxical lid-movements than the up and down excursions, and that, further, both elevation and depression of the lid may be observed as paradoxical.

We may now enumerate the attempts which have been made up to the present time to explain the significance of these striking phenomena.

Philipps (l. c.), who made the first report concerning the problem in question, did also attempt an explanation. As I remember, in his cases the question under consideration was that of depression of the left lid, accompanying contraction of the rectus internus of the same eye. The author now assumes that with the innervation of the right rectus internus there occurred a common innervation of the levator of the same eye, and on account of the slight relation existing between the elevator centers, an innervation resulted in the left levator, and for the purpose of vision, it is contended, the patient now elevates the drooping right upper lid by means of the frontalis muscle. Fuchs (l. c.) rightly views this as rather improbable.

If this attempt at elucidation, in the two only cases reported to date, appears narrow, the second attempt in 1893, by Fuchs (l. c.), on the contrary seems to bear the fault of over-generalization. Fuchs was able to do this, since he had in possession eight new cases to generalize from. His explanation is based on the acceptation of existing acquired regressive changes in the central organs, whether of primary or local development, or derivative. When the central organs, he contends, are in this condition, it is far more possible for them to invade contiguous fields by encroachment of the innervation stimulus, than when intact. This, he holds, is frequently observable in many forms of paralysis. The associate movements, which are asserted to appear also cross-wise or alternatingly, originate all in the oculo-motor center and would associate muscles which normally are unassociated. Only nuclear (central) changes are supposed to explain the paradoxical movements; changes of the higher (association) centers must in combined or accompanied movements call forth associate movements in the other eye.

Pick (l. c.) thought, in 1895, that lid-elevation accompanying subduction was spasm; this in the above-mentioned case with indications of hysteria.

In the same year the nine observations of Sinclair (l. c.) were published, contending in favor of a common supply of nerve fibres of the internus and lid muscle.

Friedenwald (l. c.), a year later, declared the explantion of these associate movements as inadequate. It would be necessary to take for granted that in the congenital cases there existed abnormal connections of the centers as well as abnormal association fibers, and those acquired cases followed paralysis, belonging, perhaps, in the group with associated movements that are observed after hemiplegia. This, in the main, is Fuchs's idea.

Parinaud (l. c.) was the first to attribute the associate movement to a cumulative motion stimulus. In his case there was bilateral paresis of the rectus superior, internus, inferior and externus; the levator as above stated was not paralyzed. The super-normal lid-elevation which followed the attempt to turn the eyes up, Parinaud accounted for, in that the entire innervation which normally directed the combined movement of the levator and rectus superior, was now united alone on the levator and thus caused the unusually strong contraction of the latter. Admitting that this elucidation is applicable in this special case, it does, however, not suffice to explain the lid-elevation in existing ptosis.

The opinion of Drooglever-Fortuyn (1899, l. c.) is a backward step from Fuchs's views, which favors the invasion of the innervation stimulus to neighboring centers, Fortuyn's case being one in which the paradoxical movement followed serious cerebral manifestations, supposed to have been nuclear changes due to acute poliencephalitis superior.

Hinkel voices the opinion that in his cases the associate movement of the lid depended upon an abnormally strongly developed innervation of the paretic muscle. Also that the lid, too, was abnormally innervated seemed acceptable to him, on the ground of an associated innervation, inasmuch as, due to the presupposition that the paralysis in process of recovery has progressed in its effect on the levator in advance, so that the opening of the palpebral fissure may result. As a fact, it frequently occurred that reconstruction of the ptosis leads in oculo-motor paralysis reconstruction. The agreement in the views of Parinaud and Hinkel exists in the point that the innervation stimulus which is directed upon a paretic eye muscle acts upon the levator on account of the inability of the latter to act. They differ therein, that in Parinaud's case we are concerned with two muscles already commonly associated, while in Hinkel's case we deal with unassociated muscles; also that in Parinaud's case the levator is adequately functionating, and consequently its action being increased by the increased stimulus acquired when called into action, whereas in the case of Hinkel, the levator is actually powerless, but is through the acquired stimulus increase, contrary to expectation, called into action, because it is contended this muscle (levator) offers less resistance than all other muscles.

Lindenmeyer attempts to sift all the proposed theories (1904, l. c.). He tries to strictly differentiate separating congenital associate movements without motility disturbances, from cases of paralysis, either congenital or acquired. In the former he holds there exists anomalous association of the centers; in the latter, he contends that Fuchs's hypothesis only holds good in undoubted nuclear (center) paralysis, that in peripheral paralysis paradoxical movements may be pre-assumed, and that the paralysis is in process of recovery in the manner that the levator presents the least disturbance with a corresponding lid-movement, in the manner that the volitional impulse acts upon the bulb direct, (while the lid-movement is only associate movement accompanying it), it follows that in case the bulb muscle is paralyzed, an abnormal impulse arises, which now centers upon the levator, because of the fact that it is easier moved than the bulb muscle, thus resulting in the lid-elevation.

This explanation is in the main covered by Hinkel, except that the latter takes into consideration the disturbances in the oculo-motor region, while Lindenmeyer, in calling attention to the relation existing between the bulb movements and the palpebral fissure, takes into consideration also the bearing of the other eye muscles.

The last work devoted to this topic is that of Blaschek (l. c.). He gives expression to the opinion that a large portion of paradoxical lid-movements can be explained on the ground of physiological movement associations, of which latter they are an exaggeration. Blaschek examined a large number of persons with a view of observing the change in the size of the palpebral fissure (l. c., S. 763), accompanying lateral eye movements, with the result that there is at times narrowing, and at times widening of the fissure, and contends that these associate movements of the lids are accentuated in paralysis of the bulb muscles. But this adds nothing to what has already been contained in Lindenmeyer's contention, that with each movement of the bulb there is a corresponding movement of the lid. Blaschek admits further the possibility, "that part of the paradoxical lid movements are due to newly built tracks, and that another portion (congenital) arises from the fact that such tracks which otherwise are only functionally employed, are from the beginning employable tracks (*i. e.*, abnormalities)." The separation of the palpebral fissure accompanying subduction of the eye, Blaschek ascribes from the cases at hand, to "spasm of the elevator and a small degree to the lowering of the lower lid. The elevator cannot be detached."

This conclusion seems somewhat strained. It is quite true that the partially paralyzed levator received a specially intense innervation impulse, but it is not proven that as a consequence of this, a spasm must arise therein. The question would then naturally arise why a spasm does not occur in other paralyzed eye muscles, since, *e. g.*, the effort to avoid diplopia is certainly fully as great as is the effort to change a monocular act of vision into a binocular act. Nor does it seem at all necessary to possess other reasons for paradoxical lid-movements, following subduction, than these following lateral eye movements; moreover, Lindenmeyer's conclusion that every bulbar movement is accompanied by its associate lid-movement, seems to account for these cases inasmuch as it permits the same causes for anomalous associate movements following subduction, as it does for lateral movements.

All hypotheses that seek to explain the associate movements accompanying paralysis, have in common the one feature, in that they leave this question unanswered., viz.: Why do not in all cases of paralyzed eye muscles, paradoxical movements arise; *e. g.*, it seems as though the abnormally strong innervation theory of paralyzed muscles ought to hold good in all cases, as well as the results drawn therefrom. Granted that there may be many cases of paradoxical movements overlooked, it remains, nevertheless, a fact, that such cases are doubtless rare, when we take into consideration the large number of cases of paralysis of the eye muscles.

As mentioned in the beginning, after summing up of all that has been offered, there still remains open for discussion the interesting question. However, it cannot be denied that there have been marked achievements obtained, the most important of which I deem the fact that the striking symptom of paradoxical lid-movement accompanying movements of the bulb is not a unitary (unexceptional) pathogenetic manifestation. Congenital and acquired cases are to be sharply separated; the acquired cases are observed as sequences of paralysis of such divers cause and nature, that for this reason even a different anatomical basis irresistibly demands recognition.

In conclusion, I beg permission to express my sincere thanks to Professor Dr. Eversbusch, for granting me the case here reported.

LITERATURE.

[1]Bernheimer, zursammengefafst in: a) Die Wurzelgebiete der Augennerven. Grafe-Samisch, Handb. d. ges. Augenheilk., 2. Aufl., I. Bd., 6. Kap. Leipzig 1900. b) Aetiologie und pathol. Anat. d. Augenmuskellahmungen, ebenda, VIII Bd., 11. Kap., Nachtrag 2. Leipzig 1902.

[2] Lindenmeyer, Uber paradoxe Lidbewegungen. Sammlung zwangloser Abhandlungen a. d. Gebiete der Augenheilk. Herausg. von Vossius. V. Bd., Heft 6, 1904.

[3] Philipps, Associated movement of upper lid with movement of eyeball. Ophthalmic Review, 1887, S. 86.

[4] Browning, Transactions of the ophthalmol. society, 1890, zit. v. Fuchs (Beitr. z. Augenheilk. II, S. 14).

[5] Pflueger, Bericht uber die 22. Versammlung d. ophth. Ges. Heidelberg, 1892. S. 202.

[6] Fuchs, Association von Libdewegung mit seitlichen Bewegungen des Auges. Beitr. z. Augenheilk. II, S. 12.

[7] Friedenwald, a) Archives of Ophth. XXII, S. 349. b) The movements of the eyelids associated with movements of the jaws and with lateral movements of the eyeballs. Bulletin of Johns Hopkins Hospit., 1896. Baltimore.

[8] Sinclair, Abnormal associated movements of the eyelids. Ophth. Review. 1895, S. 309. Ref. bei Nagel-Michel, S. 419.

[9] Brixa, Mitbewegung des Oberlides bei Bewegungen des Augapfels. Beitr. zur Augenheilk. III, S. 500.

[10] Pick, Demonstration. Prager Med. Wochenschr. 1896, S. 558.

[11] Parinaud, erwahnt v. Morina (Uber multiple Augenmuskellahmungen, 1896, S. 194 u. 199.)

[12] Wilbrand und Sanger, Die Neurologie des Auges. I. Bd. Die Beziehungen des Nervensystems zu den Lidern. Wiesbaden 1900. S. 56ff.

[13] Drooglever-Fortuyn, Uber krankhafte Mitbewegungen des Oberlides bei Bewegungen des Kiefers u. d. Augapfels. Inaug.-Diss. Freiburg 1899.

[14] Hinkel, Das Pseudo-Graefesche Symptom im Anschlufs an Augen muskellahmungen. Inaug.-Diss. Rostock 1902.

[15] Blaschek. A., Ein Erklarungsversuch der paradoxen Mitbewegungen zwischen Lid und Auge. Zeitschr. f. Augenheilk. XIII, Erganzungsheft 1905, S. 750.

THE KNOWLEDGE OF LYMPHANGIOMA ORBITAE.*

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When von Foerster, in 1878, for the first time described a cavernous lymph tumor of the orbit, which had appeared primarily within the cone formed by the eye muscles, it aroused doubt, (Berlin), since the formation of large lymphatic trunks had been observed under normal conditions in this locality. The brief and somewhat deficient description of the tumor was later completed by Wiesner, who was also enabled to describe a second case of cavernous lymphangioma of the orbit. The number of observations which has been increased to four, is still small, being evidence that this tumor formation must be considered of rare occurrence. It is, of course, not to be denied that the growth might easily be confused with some other tumor, since during its removal the main contents of the fluid might easily escape whereby the anatomical picture, especially in the hardened preparation, may undergo deceptive changes.

On account of the rare peculiarities of these observations, it seems fit to state that we are here concerned with a cavernous orbital lymphangioma, derived from the collection of Prof. Fuchs, thus adding another case to those reported to date.

To avoid oversight, I might be permitted to give a sketch after Wintersteiner of the published reports at hand.

1. Forester's case was that of a woman, æt. 46, who, since ten years, experienced a gradually increasing protrusion of the left eye. The tumor, the size of a nut, after extirpation consisted of a thin connective tissue capsule, containing numerous irregularly formed cavities lined partly with endothelioid cells and containing many lymph corpuscles. The septa consisted of a fibrillar, nucleated connective tissue, and also elastic fibers, as well as muscle fibers, the latter being isolated and arranged in bundles.

2. Case of Wiesner, woman, æt. 43. Tumor size of hazel nut, originating at the lower lid of right eye a year previously. interfering with the function of the rectus inferior muscle, without causing exophthalmos. The tumor lying below the bulb consisted of a fibrous capsule and numerous cavities with-

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*Beitraege zur Augenheilkunde, 65. Heft. 1906.

in, lined with endothelium and containing lymphocytes. The septa were composed of fibrous connective tissue and partly of loose tissue of adenoid character. Muscle fibers were only scarcely present.

3. Ayres' case, male, æt. 53. Soft tumor within the muscle cone of the orbit, with protrusion of right eye for three years. The tumor was composed of "large and small lymph cells" and endothelial-lined cavities containing many lymph corpuscles.

4. Wintersteiner's case: Boy, æt. 12 years, in whom, after birth, a protrusion of the left eye was observed. No defect in motility. The tumor, which was located within the muscle-cone, and could be detected exteriorly by palpation, consisted of an outer connective tissue covering, and cavities within, the septa of which were composed of fibrous connective tissue, including vessels, nerves and fat cells. Smooth muscle fibers in isolated bundles were found, arranged in no definite direction. The endothelial-lined cavities were engorged with blood, but contained also lymph and its ingredients. It is to be noted that there were found "aggregations partly as diffused infiltration of adenoid tissue and partly in the form of oval-round nests, or irregular, aggregated piles with only slight demarkation from the surrounding area." The blood vessels presented the picture of endarteritis obliterans.

The case of lymphangioma cavernosum orbitale which I venture to publish is that of a woman, æt. 24, with a history as follows:

Existing conditions in December, 1900. Six years previous the left eye began to advance, and at present protrudes at least 10 mm., and rests 8 mm. below the right eye. In the upper and outer part of the orbit can be felt the superior portion of a smooth tumor, which does not quite extend outward to the median line of the orbit. Color of papilla is red, but not sharply outlined. H. = 4.00 D. There are fine convoluted vessels in the papilla, perhaps as a result of new growth. With + 1.00 V. = $^5/_{12}$ (?).

Operation on January 15, 1902, with severing of lateral and superior recti in order to be enabled to luxate the bulb from the orbit. The bulb is turned on to the nose, by means of which the tumor can now be felt quite in the depth and on the temporal side of the opticus. The upper portion of the tumor has a black appearance under the tissues. During the process of freeing the tumor, a thin portion of the capsule gives way, and an entirely clear, colorless liquid escapes. The tumor now decreased in size, can be easily freed by dissection. Granular particles issue from the torn fissure. Iodoform gauze is packed into the cavity behind the bulb, which latter is replaced and the muscle stitched. Healing by primary intention. During recovery a small corneal infiltration appeared, which was followed by a slight opacity. The motility of the bulb became normal, except that abduction was effectually lost. V. = ${}^{5}/_{12}$—

Anatomic structure of the tumor is as follows: The upper surface is lobular, and is 2.5 cm. in length, and 1 cm. in breadth, but was larger before its collapse. Even upon macroscopic inspection it is evident that it contains numerous cavities of various sizes. The same is enclosed in a rather broad capsule, composed of connective tissue with but few cells, and isolated elastic fibers. The capsule, however, is rich in venous and arterial vessels, as well as a number of broad lymph chambers with endothelial-lined thin walls. Here and there are seen on the capsule aggregations of lymphocytes, partly segregated from the surrounding field and partly blending with the same. The lymph chambers referred to, as well as the lymphocyte aggregations, lie near larger vessels, and on the border of fatty tissue, presenting like structure. In the interior of the tumor are found a considerable number of greater or smaller chambers that communicate freely with each other. These contain fibrin, which, on account of coagulation, forms meshes which enclose lymphocytes in great numbers. A few of these chambers are filled with blood. The inner surface of the walls have a single layer of endothelium, but this layer is partly lost in the larger chambers. Here and there are seen on the walls homogeneous formations which resemble in form large, round cells, and are arranged in rows. A few of them are found free in the chambers, but in none can a nucleus be discerned. At some places vessels are seen, on the walls of which are broad layers of a homogeneous mass stained red by eosin. At some places these vessels are entirely filled with this mass, and again effects only a narrowing of the lumen. At times these vessels contain largely lymphocytes.

The solid mass of the tumor which comprises the septal structure consists of a connective tissue which is woven extraordinarily densely at places, and at others loosely, and is united to or continuous with the connective tissue of the capsule. It is in most portions diffused with a lymphatic liquid, and contains here and there numerous lymph cells. It can be observed that at some places the connective tissue is of certain homogeneous structure, and its nuclei are not so thoroughly stained. On account of the similarity with the tissues of mucus degeneration, some sections were stained with muci-carmin, and thionin, but a characteristic staining could not be observed. The number of smooth muscle fibers in the septa is conspicuously large. They are characterized by their lengthy shaped nuclei, which are rounded off at the ends and are arranged in strands, with strong demarkation of the cell margins. The strands formed by them vary much in thickness, and in part follow the vessel walls, but in other instances stray irregularly in the broad septa. In the interior of the tumor these muscle cells are so extraordinarily well developed and their strands are so broad and close together that they seem to comprise the larger portion of the septal structures, so that, especially at those places where the chambers have collapsed, they present the picture of myoma.

It should be noted that in the interior of the tumor elastic fibers are fully absent. In those sections which have been treated with orcein, elastic fibers are only observed in the connective tissue capsule, and in the arterial vessels. At places, there can be observed in the connective tissue, deposits of lumpy, brown pigment, the result of hemorrhage. Contiguous to this are found many lymphocytes, as well as giant cells.

According to these observations, this tumor is that of a cavernous lymphangioma. That the tumor possesses enlarged lymph chambers is indicated by the contents of its cavities. Since these contents consist foremost of lymph, characterized by the various forms of coagulation and the presence of lymphocytes. To this testifies also the history given, and also the fact that the fluid, issuing from the rupture during its removal, was a colorless liquid with no admixture of blood. The presence of blood in some of the chambers need not arouse surprise; this occurred also in the Wintersteiner case, and in much larger proportions. The exceptional conditions of the circulation in the tumor indicate that through heightened pressure blood may escape into the tissues, as shown by the abovementioned pigment deposits, and may also fill the lymphatic vessels with blood. It is well known that the enlarged lymph passages of the conjunctiva bulbi are often filled with blood.

In the anatomic picture the large number of muscle cells was unusually conspicuous. They had been observed in most of the published cases; it is, however, noteworthy that in none of these cases did the number of muscle fibers even approximately approach that in the case here under consideration, where in the septa they seem to predominate in places. The muscle strands, as already mentioned, lie partly along the vascular chambers and partly irregularly in the connective tissue. It seems thus that they primarily developed in connection with the lymph chambers and that they extended from this locality later into the proliferating septal tissues.

Further, our attention is called to aggregations of lymphocytes, which are found in more or less demarkated arrangement on the capsule and orbital fatty tissues. Wintersteiner observed aggregations of adenoid tissue and follicles in an extensive manner within the tumor itself, as well as follicular developments in the orbital fatty tissue. Von Foerster and Wiesner also emphasized that the orbital fatty tissues contained numerous lymphoid cells as well as follicles. It may accordingly be justly assumed that the tumor had its origin in the orbital fatty tissue.

Experience teaches that all observed lymphangiomas of the neck, tongue and elsewhere, are congenital, or at least primarily of congenital origin. The same seems to hold good in this lymphangioma of the orbit. The appearance of lymphadenoid tissue in the cell tissues of the orbit, in a locality which normally presents adenoid tissue, has been given as a justification of the assumption that the tumor is of congenital origin. (Wintersteiner.) According to the fundamental work of Wegner on lymphangioma, there are three possibilities of origin of the same.

1. *Ectasia with Hyperplasia.*—Slow dilatation of primary lymph tracks with new growth of the wall structures.
2. *Homoplastic Neoplasia.*—Active proliferation of the endothelium of the lymph vessels; from these solid cell masses are developed, which permit the development of hollow spaces, which, opening into pre-existing lymph vessels, become actual lymph vessels.
3. *Heteroplastic Neoplasia.*—Granulation tissue develops from a connective tissue matrix, and through secondary metamorphosis arise in indirect manner new lymph conveying passages.

The clinical course of the case here under consideration presented no exceptions, as compared with former observations. The tumor could be felt in the orbit from the exterior and could be easily outlined from its surrounding structures, effecting exopthalmos and secondary changes in the optic nerve. The motility of the eye was not restricted. The development of the tumor was, as in the other cases, very slow, six years intervening between the first appearance of the exophthalmos and its removal. The clinical picture resembles extraordinarily that of cavernous angioma of the orbit, only one symptom being absent, which Von Graefe deemed characteristic of anigioma; that is, the capacity or characteristic of the tumor to swell (enlarge) with increased pressure or disturbance of the vascular system of the eye, and with cessation of these disturbances to again recede. Nor has this symptom been observed in the other orbital lymphangiomas described since.

Concerning the therapy (operation) in the present case, it was determined by the fact that the tumor, on palpation, showed a sharp demarkation from its surroundings. This was due to the firm and quite thick capsule, which, while also present in other cases, had here an extraordinary development. This capsule permitted the removal of the tumor in toto, and facilitated the same materially. In the absence of an enclosing capsule, the treatment demands quite different consideration. Prof. Fuchs, by reason of a varied experience, avoided removal of these angiomas, which, without a sharp border, blend with the surrounding tissues; because if the ectastic lymph vessels are severed in the operation, which is unavoidable, the entire tumor contents will escape, obliterating the tumor-boundary so that it cannot be seen what is to be removed. A clean extirpation is, therefore, impossible, unless we remove the entire orbital contents, which is not indicated in a form of benign tumor like lymphangioma.

In these cases it is therefore advisable to effect the gradual destruction of the tumor by means of repeated treatments by electrolysis. The method is as follows:

The cathode of a battery is armed with a heavy steel needle, and the anode plate is applied to the temple, then by inserting the needle into the tumor the circuit is closed. At each sitting several such needle insertions are made, beginning at the periphery of the tumor, advancing gradually to the center. With this form of treatment, the tumor can be reduced in size and the exophthalmos be made to disappear. Naturally, it is to be admitted that a few remaining lymph vessels form the starting point of a recurrence, for which reason the electric treatment has to be repeated after longer intervals. That this otherwise harmless therapeutic measure may at times have untoward effects, is evidenced in a case of lymphangioma whose course in several respects seems remarkable. This case, female patient, æt. 20, was at the time treated at the II. Vienna Eye Clinic. History: June, 1897. At the age of four years there appeared the first protrusion of the right eye, which increased gradually. Patient well nourished, good physique, and no enlarged glands. The right palpebral fissure is from 3 to 5 mm. lower than the left; not longer, but wider than the left. The right lower lid is covered by a grayish, red swelling formed by the edematous conjunctival fold. The right upper lid is twice as long as the left. The skin of the lid is normal, as is also the conjunctiva, excepting the semilumar fold, which even by straightforward vision shows a swelling of a grayish-red color. On separating the lids, there appears above, but in contact with the plica semilumaris, a mass the size of a bean, movable on the bulb, resembling edematous conjunctiva, soft in texture and compressible. The right bulb is pushed forward about 1 cm. and downward ½ cm., but is otherwise normal. The touch reveals behind the bulb, filling the orbit, a soft mass, in which may be detected, at the inner and upper octant, some strands that offer more resistance. The superior oblique muscle and the trochlea can be easily located by palpation.

After twenty-four electrolytic treatments during two months had been concluded, there was a marked reduction in the exophthalmos. But upon reappearance of the patient in October of the same year, the same had again increased to 2 cm., whereupon the electrolytic treatment was resumed, and after twenty-four sittings there was a marked reduction of 4 mm. in the exophthalmos. In 1903, the patient again appeared with increased exophthalmos, again requiring electrolytic treatment. Now, at the present time, since November 12, 1905, the patient has again returned to the Clinic. After a number of electrolytic sittings, without any unusual events, had been administered, the punctures being directed into the inner and lower portion of the tumor, there occurred, after the treatment on November 20, on the following day, a sudden increase in the exophthalmos, augmenting the next day to such dimensions as to prevent closure of the lids. At the same time bloody suffusion of the lids occurred, as well as loss of vision, which had been entirely unaffected heretofore. Ophthalmoscopic observations revealed clear media, papilla white, arteries thin and threadlike, and at places invisible. The fundus surrounding the papilla to the extent of about four times the diameter of the latter, is blanched white. The veins present normal caliber. We have thus a typical picture of occlusion of the central artery, excepting that the red spot in the macula is absent.

Nov. 24. The condition of the tumor is not changed. Slight perception of light at six metres, projection uncertain. Ophthalmoscopic observation: The opacity of the fundus has increased in intensity. The papilla is as white as the adjoining retina, showing no line of juncture. The veins are extraordinarily broad and tortuous, with interrupted course at places. Arteries, thin and thready. In the erect image there can be observed, inward, just above a very tortuous vein, a white area of about two dioptries in height, showing distinct folds.

Nov. 29. Fundus turbid as before, and arteries unchanged. The enormously engorged veins are especially conspicuous below and inward from the papilla in the area of the well-defined retinal folds. The crests of the folds reach a height of seven dioptries, overhanging or reflecting upon themselves, as shown in the break of the course of the veins.

Dec. 3. The folds and gray turbidity of the retina are unchanged. There is observed, extending horizontally from the papilla toward the macula, a white spot with serrated margin, in breadth one-fourth the diameter of the papilla; surrounding this, the fundus has a slate-gray appearance; within this spot is seen a small hemorrhage.

Dec. 14. Papilla white and nearly demarkated. The arteries, and especially the veins, at frequent intervals contracted. The veins are still quite tortuous, but significantly less so than formerly. The fundus is throughout of reddish color. The white spot extending from the papilla to the macula has sharper boundaries, but no change in the hemorrhage. Vision same as formerly.

The history of this case establishes that we are concerned with a tumor of the orbit, with no well defined boundary lines separating it from the surrounding orbital tissues, and of soft and compressible texture. Since in spite of the marked extensions of the tumor there was absence of venous ectasia in the contiguous area, it was diagnosed lymphangioma cavernosum orbitæ, even though there was absence of swelling upon engorgement of the vascular system. Extirpation without the removal of the contents of the orbit seemed impossible, for which reason obliteration by electrolysis was undertaken. But from the history we see that a lasting recovery was not achieved by this method, effective though it seemed. Following one of the punctures, a strong hemorrhage occurred, which passed into the orbital tissues and lids, as also perhaps into the lymph chambers of the tumor. With this increased the exophthalmos and in a brief time also vision passed away. Other causes had to be excluded, chiefly since there were no inflammatory manifestations locally, nor was fever present.

The ophthalmoscope first revealed the picture of an interruption of the supply in the central artery, as characterized by the ischemia of the papilla and retina, as well as the cloudiness of the latter. After a few days the picture changes, presenting now the picture of a venous engorgement, such as is most frequently observed in thrombosis of the central vein.

The disturbances, as at first observed, can be accounted for through injury of the central artery. The cause could not have been an orbital hemorrhage, with its consequential compression of the vessels, because this would have affected the veins first, and brought on a venous engorgement also first. Since in this case we have the picture of an interrupted arterial blood supply, we must assume that the artery was injured by the puncture. The venous engorgement is effected by the reduction of the blood pressure, increasing in appearance until it resembles the picture of thrombosis of the central artery.

The conclusion in regard to this case is in harmony with the views of Harms, which he derived from a large mass of anatomical material illustrative of the so-called post-anemic hemorrhage, or hemorrhagic infarction. He found, "that these ophthalmoscopic changes cannot be accounted for by the development of an actual hemorrhagic infarction in Cohnheim's sense, that it is the expression of a combination of the clinical picture of the so-called embolism of the central artery with thrombosis of the vein, and not only from a clinical, but especially from an anatomical viewpoint."

In concluding my deductions, I desire to express my sincere thanks to Prof. Fuchs for the stimulus he rendered, and for furthering my labors.

LITERATURE.

v. Foerster, Arch. f. Ophth. 1878.
Wiesner, Arch. f. Ophth. XXXII.
Wintersteiner, Arch. f. Ophth. 1898.
Berlin, Graefe-Saemisch, Bd. VI, 705.
Wegner, Arch. f. Chirurgie XX.
Harms, Arch. f. Ophth. 1905.

ASTIGMATIC ACCOMMODATION: A STUDY OF ITS RELATIVE FREQUENCY IN 50 CASES WITH MARKED ASTHENOPIC SYMPTOMS.

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Astigmatic accommodation, or spastic astigmatism, implies the presence of astigmatism and the action of the accommodation. The question as to whether or not there is such a thing as astigmatic accommodation has often been raised, and it is today a disputed one. I have been unable to find anything in medical literature of a very conclusive nature in regard to it. The first who advocated this condition was Dobrowolsky, in 1868, (*Archiv. fuer Ophth.*). His work was done only by means of atropin and the stenopaic slit, and hence necessarily must have been inaccurate. After him, Javal, de Wecker, Martin, and others, claimed to have recognized the condition, but their work left much to be desired. Nettleship, Fuchs, Schmit-Rimpler, Valk, Tiffany and Noyes all mention the condition in their books. Savage (*Ophthalmic Myology*) has more to say concerning it, and gives the most satisfactory explanation of any modern author. Starkey, in the *Journal of the American Medical Association*, 1895, p., 853, gives an article on the subject. Gibbons touches on the subject in *Ophthalmology*, July, 1905. Eaton contributed an interesting article on spastic astigmatism before the section on ophthalmology of the American Medical Association at its meeting at Portland last year.

That there is still a question in the minds of some of our best ophthalmologists as to the existence of spastic astigmatism cannot be doubted. Knapp says: "The subject of astigmatic accommodation has been considered since the regular astigmatism was scientifically and practically established, but, to my knowledge, nothing has come to light. When I was in Heidelberg, *i. e.,* from 1858 to 1868, it was investigated, but without any result. I thought once there was such a thing, but the positive proof was wanting, and Helmholtz, also, would not believe in it." (Reply to following circular letter.) Tscherning, Hess, Sulzer, Eriksen, and especially G. Bull, opposed the idea of astigmatic accommodation.

Tscherning (*Physiologic Optics,* p. 130) says: "The alleged astigmatic accommodation was always of a very low degree, *i. e.,* 1 D. to 1.50 at most. Frequently, in order to discover it, a very persistent atropinization was necessary, lasting as much as fifteen days, and even until symptoms of poisoning appeared.

I think that frequently the patient, weary of the struggle, ended by answering all that was desired."

The published reports of the cases have been too indefinite to permit of accurate conclusion, and hence there is some excuse for the doubt that exists concerning the condition. For years I have been convinced that something of the kind was necessary to explain the difference in the amount of astigmatism as found before, under the influence of, and after the use of a mydriatic. In my opinion there are two forms of astigmatic accommodation. The first form is exercised by almost every astigmatic patient, while the latter is very seldom found, and then only in persons who have had a great deal of trouble in securing satisfactory lenses, and who, as a rule, have been to more than one oculist. A sectional action of the ciliary muscle can easily be provoked by simply placing a weak cylinder before the eye of a young emmetrope. On making an experimental examination on twenty subjects, under the age of twenty years, the placing of a plus or minus cylinder of one-half dioptre had no material effect on the acuteness of the vision, and some of the subjects had an acuteness of vision as high as $^6/_5$, with as much as a plus or minus 1 D. cylinder. This form of simple spastic astigmatism I consider exceedingly common in young subjects with slight degrees of astigmatism. It is probably exercised to some extent by all persons who have astigmatism of less than one or two dioptres, and this is probably the form of astigmatism referred to by the gentlemen who answered my letter. (See next page.)

The second form of astigmatic accommodation, which I think should be separated from the first, and which I shall term *Tonic* astigmatic accommodation, is exceedingly uncommon, and I doubt if it is usually recognized. All subjects with this condition suffer a great deal from some form of eyestrain, and are seldom correctly fitted, and probably never without the prolonged use of atropin. It is my opinion that atropin does not relieve this by paralyzing the ciliary muscle. Savage claims that as Bowman's muscle is supplied by the superior cervical sympathetic, that it is not influenced by atropin. This is very probably correct, and it helps to explain the necessity for the profound use of atropin. If atropin paralyzed this muscle at once, as it does the ciliary muscle, it would not be necessary to use it more than a few days. The prolonged action of atropin does not relieve the astigmatic accommodation by paralyzing Bowman's muscle, as Savage has properly suggested, but it does relieve the astigmatic accommodation indirectly. It suspends the accommodation, and deprives the eye of acute vision, thus removing the necessity for the astigmatic effort. Astigmatic accommodation is primarily produced in the interest of acuteness of vision. The guiding sensation of the retina no longer demands this action of Bowman's muscle when the accommodation is paralyzed by atropin, and it is only necessary to use the atropin a sufficient length of time to permit this spasm to relieve itself. The length of time required to produce this result will necessarily vary, according to the nature of each case.

In order to obtain the opinion of the American oculists upon this subject, I have written the following letter to sixty well known men, and received answers from about thirty:

I. Do you consider that there is such a condition as astigmatic accommodation, that is, do persons with astigmatism of the cornea cause a deformity of the crystalline lens in an effort to overcome this corneal astigmatism?

II. In your opinion, what proportion of difficult cases exercise this faculty?

III. Do you consider astigmatic accommodation present in cases of 1 D., or more of astigmatism where the acuteness of the vision is as high as $^6/_6$?

IV. What are the means of detecting astigmatic accommodation?

It was the opinion of all who replied to this set of questions that there is such a condition of astigmatic accommodation. The answers, were, however, indefinite on some points, and I decided to try another set of questions, which read as follows:

I. Do you think there is such a condition as astigmatic accommodation? If so, what are your reasons for thinking it?

II. Have you reported any case of astigmatic accommodation? If so, where?

III. Do you know of any reported cases of latent astigmatism, known as such, that you consider indisputable cases of astigmatic accommodation? Refer to literature.

IV. In your opinion, is latent astigmatism a common occurrence?

V. Have you had any cases that you were positive were latent astigmatism, that you have not reported?

VI. What are the tests necessary to be made before one can say that he has a case of astigmatic accommodation?

VII. Do you consider it possible to detect astigmatic accommodation without the use of the ophthalmometer?

VIII. Do you think that any test for astigmatic accommodation is conclusive without the use of the retinoscope?

IX. Would you consider latent astigmatism present in a case, reported as such, when no means of detecting it was used, except the stenopaic slit, followed by atropin?

It was the opinion of Wuerdemann, Reynolds, Ellett, Dabney, Hale, Dunbar Roy, Veasey, Melville Black, E. E. Holt, Gould, Myles Standish, Nelson M. Black, Todd, Weeks, Jackson, Casey A. Wood, and others, that there is such a condition as astigmatic accommodation. Herman Knapp, Henry Bruns and a few others were of the opinion that such a condition does not exist. A great many were not willing to express an opinion upon the subject, saying that their knowledge of the topic did not justify them in rendering an opinion. No one had reported any case of astigmatic accommodation, nor did any one refer me to any literature on the subject, except what is found in Tschnerning, and to Gibbons' article in *Ophthalmology,* in July, 1905. The opinion as to whether latent astigmatism is a common occurrence varied; about 30 per cent. believing that it is. Many had seen cases which they were positive were latent astigmatic cases, which they had not reported. The tests necessary to determine a case of astigmatic accommodation, as given by most of those who answered the question, was a thorough examination with, and without, cycloplegia, which should be atropin, full objective and subjective tests; including the examination with the ophthalmometer, direct ophthalmoscopy, and skiascopy. About one-fourth thought that the ophthalmometer is a necessary instrument. About one-tenth thought that astigmatic accommodation could be conclusively determined without the use of the retinoscope. To question IX only two answered in the affirmative.

In order to obtain some idea of the frequency of the occurrence of astigmatic accommodation in asthenopic cases, I began four years ago to make a special study of each difficult case in my private practice. I have excluded all cases over which I could not have perfect control, as to the length of time I should use the mydriatic, and all other cases that for any reason had any objectionable feature that might prejudice the results.

The method of the examination was as follows: An ophthalmometric examination was first made and recorded. Next the ophthalmoscopic examination was made. Then a subjective examination was made by means of the distant chart and the trial lenses. Special effort was made in making this test to bring out all the hypermetropia and astigmatism present.

I endeavored in each case to see how near the subjective examination approximated the ophthalmometric and ophthalmoscopic examinations. I next used homatropin solution, one grain to the dram, one drop in each eye, every three to five minutes, until eight or ten drops had been used. In thirty minutes after the last instillation I did a retinoscopy, retook the ophthalmoscopic and ophthalmometric examinations, and made records of the same. I now made a subjective examination with trial lenses, using the pinhole disc. The error as thus found was corrected—allowance being made for age and other conditions—and the lenses worn for a sufficient length of time to demonstrate their efficiency, or inefficiency. After varying lengths of time, from one to six months, these patients were placed under atropin, six grains to the ounce, one drop in each eye, three times a day, for from three to ten days. At the end of this interval, examinations were made, as was done under the influence of homatropin, on two consecutive days.

Glasses were prescribed from the atropin examination and comfort was secured in each of the reported cases. All of these cases were more or less incapacitated from constant and difficult work, and all had suffered with headaches, nervousness, insomnia, pains in the eyeballs, or some of the various symptoms of asthenopia. The majority of these cases had been fitted more than once before they came to me, and as previously stated, were fitted by me first under homatropin. The subjective and objective tests made, both under homatropin and atropin, were in every respect the same. Post-mydriatic tests were made in each case. The supreme test of personal comfort has shown that the last correction was the only proper one.

In making these observations, I have studied fifty cases in my private practice, all of which had unusually severe asthenopic symptoms. Out of the 100 eyes examined, I have been able to find only five which I could be positive were suffering with tonic astigmatic accommodation. Out of the entire number there was an increase of astigmatism, or a change of axis in 32 eyes. The increase of astigmatism, however, amounted to only 0.25 D., in 27 eyes, which I consider too slight a defect to be enumerated with the other five. While it is possible that an error of 0.25 D. was made in these cases, it is very improbable. In cases where the examinations did not correspond, more than two examinations were made. The cases, which I report below, show an increase of astigmatism ranging in amounts from 0.50 D. to 1.50 D.

Case I. M. S., age 15, came to me on account of obscure vision, and headaches, especially after using her eyes. She was wearing a pair of — 2.50s, fitted by an optician.

Ophthalmometric Ex.

R. = 4.50 D. ax. 90°.
L. = 4.25 D. ax. 90°.

Subjective Ex.

R. V. $^6/_{60}$; — 1.0s ⊃ + 3.0 cyl. ax. 90° V. = $^6/_{12}$.
L. V. $^6/_{60}$; — 1.0 ⊃ + 3.0 cyl. ax. 90° V. = $^6/_{12}$.

Homatropin was instilled, one drop in each eye every three to five minutes for eight instillations, and in thirty minutes the examination was as follows:

Ophthalmometric Ex. Same as above.

Skiascopic Ex. $\left\{ \text{R.} \quad \begin{matrix} -1.75 \\ +1.25 \end{matrix} \qquad \text{L.} \quad \begin{matrix} -1.75 \\ +2.00 \end{matrix} \right.$

Subjective Ex.

R. — 1.75 s ⊃ 3.00 cyl. ax. 90° V. = $^6/_9$ pt.
L. — .75 s + 3.75 cyl. ax. 90° V. = $^6/_9$ pt.

This correction was worn with some benefit for several months, after which time she again complained of headaches, and as she wished soon to begin a business course, she was anxious to have her eyes re-examined. Atropin was ordered, six grains to the ounce, one drop in each eye three times a day for four days. At this time the examination was as follows:

Ophthalmometric Ex. Same as above.

Skiascopic Ex. $\left\{\text{R.}\ \begin{matrix}-1.00\\+3.50\end{matrix}\qquad \text{L.}\ \begin{matrix}-1.25\\+3.00\end{matrix}\right.$

Subjective Ex.

R. — 1.00 s + 4.50 cyl. ax. 90° V. = $^6/_6$ pt.
L. — 1.25 os + 4.25 cyl. ax. 90° V. = $^6/_6$ pt.

Since ordering the stronger cylinders, she has been relieved, despite the fact that she has spent the year in a business school. In this case we have a difference of 1.50 D. in the right eye, and 0.50 D. in the left, which was not shown by the retinoscope under homatropin, but which was evidently present, as was indicated by the comfort secured under the proper correction.

Case II. Miss A. B., a school teacher, has had trouble with her eyes since childhood. She has secured glasses, both from opticians and oculists. Her lids are red and irritated, and she suffers with headache a great deal of the time.

She is wearing

R. — 0.25 cyl. ax. 180°.
L. — 0.50 cyl. ax. 180°.

Ophthalmometric Ex.

R. 0.75 D. ax. 90°.
L. 1.75 D. ax. 90°.

Subjective Ex.

R. — 0.75 cyl. ax. 180° V. = $^6/_6$ pt.
L. — 1.12 cyl. ax. 180° V. = $^6/_6$ pt.

Homatropin was instilled in the manner as indicated above, and the retinoscope showed:

$\left\{\text{R.}\ \begin{matrix}-0.25\\+\ .50\end{matrix}\qquad \text{L.}\ \begin{matrix}-0.12\\+1.00\end{matrix}\right.$

Subjective test.

R. — .25s $\overset{\frown}{\smile}$ + 0.75 cyl. ax. 90° V. — $^6/_6$ pt.
D. — .12s $\overset{\frown}{\smile}$ + 1.12 cyl. ax. 90° V. — $^6/_6$ pt.

This correction was satisfactory for a short time only, when her headaches returned with other symptoms. Atropin was now used and the retinoscope showed:

$\left\{\text{R.}\ \begin{matrix}+0.12\\+1\ 00\end{matrix}\qquad \text{L.}\ \begin{matrix}-0.12\\+1.62\end{matrix}\right.$

Subjective Ex.

R. + 0.12 $\overset{\frown}{\smile}$ + 0.87 cyl. ax. 90° V. = $^6/_6$.
L. 0 — 0.12 $\overset{\frown}{\smile}$ + 1.75 cyl. ax. 90° V. = $^6/_6$.

On leaving off the spherical lenses, and prescribing the plus cylinders, she has been completely relieved, and with the exception of some obscuration of distant vision, as compared with her former lenses, they have been entirely satisfactory. She has taught one year since securing these lenses without a return of her former symptoms.

Case III. Mrs. L., aged 55, came to me complaining of inability to read for any length of time; of pains in the eyeballs, and nervousness. She brought with her a collection of some half dozen pairs of glasses, none of which gave her any relief. She had not been able for a number of years to read without getting a pain in her head, or an eye-pain. Any slight amount of eye-work would cause her much discomfort, either with or without her glasses.

Ophthalmometric Ex.
R. 1.00 ax. 150°.
L. 1.75 D. ax. 20°.

Subjective Ex.
R. V. $^6/_5$ pt. + 0.75 cyl. ax. 150° V. = $^6/_5$.
L. V. $^6/_5$ pt. + 1.00 cyl. ax. 20° V. = $^6/_6$.

Homatropin was used every five minutes for seven instillations, and within thirty minutes the retinoscope gave:

$$\left\{ \text{R.} \begin{array}{l} +0\ 50 \\ -\ .50 \end{array} \right. \qquad \text{L.} \begin{array}{l} --1.00 \\ -\ .\ 0 \end{array}$$

Subjective Ex.
R. — 50s ⊃ + 1.0 cyl. ax. 150°. V. = $^6/_5$ pt.
L. V. + 1.0 cyl. ax. 110°. V. = $^6/_6$ pt.

This correction was ordered for distance, except the sphere was reduced to 0.25 in the right eye, and in as much as her power of accommodation was unusually active for one of her age, her distant vision for either eye was $^6/_6$, while she was able to read No. 1 Jaeger type for near, I ordered a + 1.75 s for each eye for reading, with plus cylinders at the proper angles instead of minus ones. She, being improved for a short time only, returned for further relief. After reviewing my work carefully, and feeling sure that I had made no mistake, I decided in as much as she had an unusual amount of accommodation remaining, and in view of the fact that she had not been able to obtain any relief from any source, that I would be justified in using atropin in order to give her eyes perfect rest, and permit me to detect any astigmatic accommodation, if such were present. I gave her atropin, six grains to the ounce, and ordered one drop in each eye, three times a day. This she used for six days before the retinoscope showed the amount of astigmatism, as indicated by the ophthalmometer. At this time the examination was as follows:

Ophthalmometric. Same as above.

$$\text{Skiascopic Ex.} \qquad \left\{ \text{R.} \begin{array}{l} +0.50 \\ -0.50 \end{array} \right. \qquad \text{L.} \begin{array}{l} -1.00 \\ +0.75 \end{array}$$

Subjective Ex.
R. +0.25 cyl. ax. 105° V. = $^6/_6$ pt.
L. + 0.25 s ⊃ + 0.25 cyl. ax. 90° = $^6/_6$ pt.

I ordered for distance:
R. + 1.00 cyl. ax. 160°.
L. — .75 s ⊃ + 1.75 cyl. ax. 20°.

For near:
R. + 2.75 s ⊃ + 1.00 cyl. ax. 160°.
L. + 2.00 s ⊃ + 1.75 cyl. ax. 20°.

With this correction, she has been relieved of her former symptoms.

Some may seriously object to the use of atropin in a case of this age. I consider it not dangerous when the power of accommodation is so good as it was in this case. When a patient can see No. 1 Jaeger, and can read $^6/_6$ at a distance, even at the age of fifty-five—a thing exceedingly unusual, even in cases of mixed astigmatism, I do not consider we are running any great risk in using atropin. The accommodation should be as much our guide as to when we should use atropin in a case, as the number of years the patients has lived.

Case IV. February 14, 1904, Miss M. W., aged 40, came to my office, complaining of headaches, and eyes growing very tired on use, with burning of the lids.

The ophthalmometer showed
R. 0.75 D. ax. 140°.
L. 0.25 D. ax. 90°.

Subjective test.
R. V. $^6/_9$, + 0.25 cyl. ax. 105° V. = $^6/_6$ pt.
L. V. $^6/_6$, + 0.25 s ⊃ + .25 cyl. ax. 75° V. = $^6/_6$ pt.

Homatropin was instilled, one grain to one dram, one drop in each eye, every three to five minutes, for eight instillations. In thirty minutes after last instillation, retinoscopy showed the following results:

$$\text{Skiascopic Ex.}\quad \left\{\text{R.}\ \begin{matrix}.\ 0\\0.25\end{matrix}\qquad\quad \text{L.}\ \begin{matrix}0.25\\0.50\end{matrix}\right.$$

Subjective test under homatropin.
R. 0.25 cyl. ax. 105° V. = $^6/_6$ pt.
L. 0.25 s ⊃ 0.25 cyl. ax. 90° V. = $^6/_6$ pt.

Glasses were ordered from the above examination, but on March 27, the patient, not being entirely comfortable, was placed under atropin, six grains to the ounce, one drop in each eye three times a day. On the third day, the examination was as follows:

$$\text{Skiascopic Ex.}\quad \left\{\text{R.}\ \begin{matrix}+1.00\\+0.25\end{matrix}\qquad\quad \text{L.}\ \begin{matrix}+0.25\\+0.50\end{matrix}\right.$$

Ophthalmometric Ex.
R. 0.75 D. ax. 140°.
L. 0.25 D. ax. 90°.

Subjective Ex.
R. + 0.25 $\overset{\frown}{\smile}$ + 0.75 cyl. ax. 140° V. = $^6/_6$.
L. + 0.25 $\overset{\frown}{\smile}$ + 0.25 cyl. ax. 90° V. = $^6/_6$.

The above glasses were prescribed and have now been worn more than a year with entire comfort and satisfaction. That there was an astigmatic accommodation in the right eye that caused the axis of the corneal astigmatism to be different from the axis of the astigmatism, as shown by the subjective test, I think cannot be denied. In this case the false axis predominated before the use of the homatropin—the axis of preference being 105° and 75°, and the false axis continued in the right eye even after homatropin had been used.

From the study of these cases, I feel justified in drawing the following conclusions:

I. Astigmatic accommodation in the simple form is an exceedingly common occurrence, and is usually associated with few, or no symptoms.

II. That tonic astigmatic accommodation is an exceedingly uncommon condition, and is always associated with marked asthenopic symptoms.

III. That no method of determining tonic astigmatic accommodation is conclusive, without the use of a weak cycloplegic, (homatropin) followed later by atropin, and the subjective and objective tests carried out with the minutest detail, the patients being examined before, while under and after the use of each mydriatic.

IV. That it is probable that atropin does not relieve tonic astigmatic accommodation, *per se,* but that it does so by diminishing vision and thus removing the necessity for the astigmatic effort.

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FIELD OF FIXATION AND METHODS OF MEASURING IT.

By Lucien Howe, M. D.,

BUFFALO.

From the first volume of "The Muscles of the Eye." Now in press by G. P. Putnam's Sons, New York.

Field of Fixation and Methods of Measuring It.—All the points which an eye can see or "fix," while the head meanwhile remains immovable, constitute the *field of fixation* or the *motor field.* When we reach the pathological aspects of our subject, we shall find that even slight variations in the limits of this field have in some cases an important bearing on questions of diagnosis and treatment. Nearly all of the text-books point out the desirability of ascertaining the extent of these rotations, if only to recognize cases of suspected paresis, but the real fact is that such measurements are seldom made. Probably this is because the methods thus far employed are unsatisfactory. We can measure the extent of this field either subjectively or objectively.

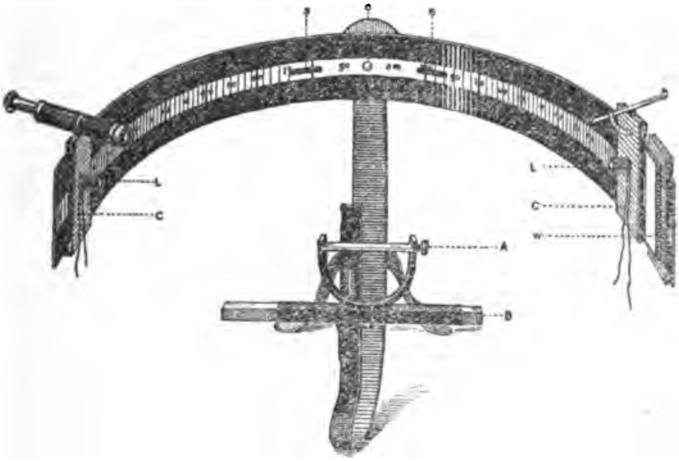

Fig. 1.

Perimeter with a gun-sight and also a telescope attachment for measuring the field of fixation.

(A) The subjective method consists in having the patient look with one eye at an object when that is moved through a given arc, in, out, up, down, or in any oblique direction. Most of the records given in the text-books were obtained in this way with the aid of the perimeter. But it is often difficult to decide whether the test object is seen directly, or with a part of the retina which is more or less eccentric. Even one who is accustomed to laboratory methods will readily make this mistake. In order to obviate that difficulty Wood (B. 456) attached on the inside of the perimeter, a strip of paper on which words of two letters are printed. The ability to read these words when the arc is placed in different meridians indicates the extent of the rotation of the globe.

(B) The objective methods of measuring the field of fixation are, in general, the most satisfactory, although for this, suitable apparatus is required. Here, again, most physiologists and clinicians have depended on the perimeter.

The Perimeter.—After many trials with various forms of this instrument, I have found that the excursions of the globe can be determined most satisfactorily by attention to the following points:

First, to lessen the sources of error, the instrument as a whole should be of considerable size. One much used in this country, having a diameter of fifty-five centimeters, is none too large. It has been found that various small changes could be made in this instrument, as shown in Fig. 1.

(*a*) *The arc* should be graduated in degrees on both the in and outside of the band for convenience in reading. At the zero point there should be an opening five or ten millimeters in diameter through which it is easy for the observer to look at the eye which is being measured. In addition, there are two slots *s s* for another purpose, which will be mentioned later. When centering the globe in the arc of the perimeter, we have the subject look through the circular opening at the zero point, and if the eye of the observer is on the other side of this opening it is easy to see that the radius of the perimeter at that point passes also through the observed eye.

But the eye, while still in the line of that radius may be too near the perimeter or too far from it. Ordinarily, we then move the head of the subject a little farther forward or backward, as the case may be, and try to sight across the arc from one of its extremities to the other, at the point marked 90°. In doing this, however, the observer is not sure that his own eye is even approximately e extremity of the arc.

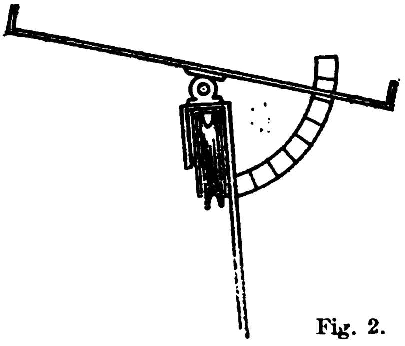

Fig. 2.

Gun-sight attachment to the perimeter to assist in bringing the center of the eye to the center of the arc.

(*b*) *Gun-sight Attachment to the Perimeter.*—In order to obtain greater accuracy in this respect, it is convenient to have a carrier or band which slides along the arc and to which a small gun-sight is attached (Fig. 2). This is nothing more than a strip of brass about five centimeters long and four millimeters wide. The ends are bent at right angles to the rest of the strip, one is filed into a point, and the other indented as a notch. The central portion of the gun-sight is fixed to the top of the carrier with a hinge, and is adjusted carefully at right angles to the arc, so that wherever placed, it is in line with a radius of the perimeter at that point. There is also attached to the inner surface of the carrier a small graduated arc, its center being the same as the hinge on which the gun-sight tips. Its purpose is to mark the number of degrees which the gun-sight must be depressed in order to point at a certain portion of the globe. While this small arc is rather convenient, it is not necessary.

After the globe has been brought into line with the radius, which passes through the central point of the perimeter, the carrier containing the gun-sight is slipped on the arc and the observer sights across this at the eye of the subject. It is still impossible to know with exactness that a given radius passes through the center of motion of the globe, but if the observed eye be brought to a position near the center of the arc, so that the radius marking 80 or 90 degrees on the perimeter impinges upon the observed eye just posterior to the cornea, as indicated by the gun-sight, and if, at the same time, the globe be in the line of the radius passing through the zero point, as just described, the center of motion of the globe then corresponds practically to the center of the arc of the perimeter.

(*c*) *Telescope Attachment to the Perimeter.*—While the gun-sight enables us to make more accurate observations than with the naked eye, still more constant results can be obtained in measuring the excursions of the eye by mounting a small telescope[1] on a carrier in the same way as the gun-sight—that is, exactly in the direction of a radius of the perimeter. Another carrier, weighted with a lead band, must, however, then be placed on the opposite arm of the perimeter to act as a counterpoise. One great advantage of the telescope over the gun-sight is that when the eye turns outward to a point where it reaches nearly the limit of fixation, and remains there but for an instant and perhaps with a tremulous motion, we can observe its behavior through the telescope better than when simply viewing it with the naked eye.

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[1] These telescopes, measuring twelve centimeters long and having a diameter of two and a half centimeters, are sold by several opticians at two or three dollars. It is necessary, however, to place in front a spherical glass of about twenty-two diopters, in order to shorten the focal distance sufficiently to make them useful on the arc of a perimeter.

(*d*) *Electric-Light Attachment.*—The objective examination can also be made more accurately by attaching a small electric light to the carriers. This had already been done in measuring the field of vision. When, however, such a light is placed just below the gun-sight or the small telescope, then as the patient's eye follows the light, the observer, looking over the gun-sight or through the telescope, sees the bright reflection just in the center of the pupil. In this way, still greater accuracy is possible in deciding how far the globe has rotated. The battery for the lamp is a small dry cell, such as is found in any of the electrical supply shops. By a spring switch, the lamp is lighted or extinguished as desired, the whole being simple and inexpensive. Of course it is unnecessary to make use of both the gun-sight and the telescope. For most purposes, the former is sufficient, although it is not entirely accurate.

If we depend exclusively on either the subjective or the objective methods, errors are apt to occur. It is therefore desirable to employ both, and with a little practice the measurement can be made quickly and easily. But in spite of every precaution in the construction and use of the perimeter, it is still an imperfect instrument for measuring the excursions of the globe. As the nose projects in the median line and the brow above, and as it is impossible to sight over the arc from below upwards, the view in these directions is, of course, restricted. These difficulties led to the construction of the tropometer.

The Tropometer.—Many of the earlier students, appreciating the great clinical importance of the field of fixation, have made efforts to measure it otherwise than with the perimeter. As early as 1876 Nicati constructed an instrument which he called a tropometer (B 451-453), the object being to determine the excursion of the globe by measuring the tangent of the arc through which it rotated. Later Stevens (B 460) described a more complicated instrument constructed on the same general principle and called by the same name. This is the one best known at present, having been figured by Maddox, De Schweinitz, and others, but ingenious contrivances for accomplishing the same purpose have been arranged by Eaton (B 461) in this country and by others elsewhere.

Stevens' tropometer consists essentially of a head-rest of rather complicated form, and a telescope with which to view the cornea. Instead of looking directly at the eye, however, this telescope is placed at right angles to the axis of vision of the subject, and a mirror opposite the telescope at an angle of 45 degrees reflects into the telescope the image of the cornea. The best part of this instrument is a tangent scale which is placed in the eyepiece, and which shows through how many degrees a given point of the cornea—or really how far the edge of the cornea—is rotated in any direction.

After considerable experience with Stevens' tropometer, I have found that it is entirely unnecessary to turn the telescope at right angles to the axis of vision of the eye examined. After a time I removed the box at its distal end, and, directing the tube straight at the patient's eye, a clearer image and equally accurate measurements were obtained. Moreover, it was found that, instead of multiplying instruments, it was easy to change the ophthalmic microscope, (Fig. 117), which was used at first only for viewing the pupil, into a very excellent tropometer. This is done by placing a minus spherical in front of the object glass to lessen the magnification, and then using an ocular which contains a tangent scale.

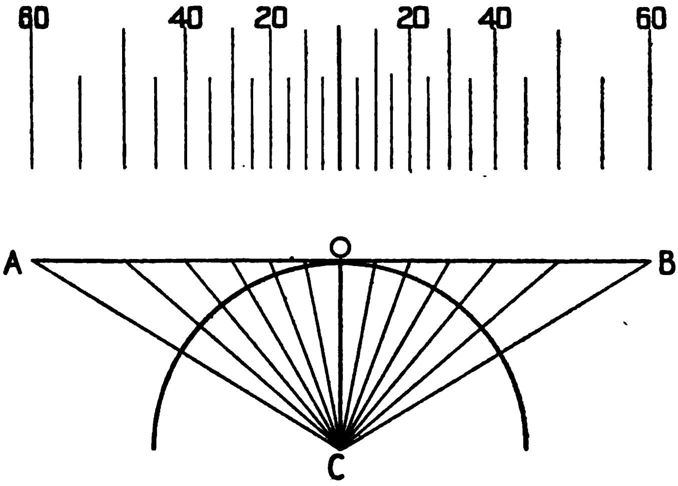

Fig. 3.

Tangent scale in the eyepiece of the tropometer. (Much enlarged.)

For those who have forgotten the exact meaning of this term, the accompanying diagram (Fig. 3) may be of some assistance. Thus, if different radii be drawn from the point C, at intervals of say ten degrees each, to the line AB, which is tangent to the arc at the point O, then the points at which these radii intersect the tangent AB would mark off what we may call a "tangent scale." Instead of drawing this one line horizontally across the field of the instrument, it is better for our purpose to have a number of parallel lines whose distances from each other are the same as the distances at which the different radii intersect the tangent already referred to. Theoretically, it would be quite sufficient to have a single tangent scale stretching across the field. In practice, however, it is sometimes more convenienet to have two such scales. One of these, numbered from right to left, measures the rotations of the globe in one direction, and another scale, numbered from left to right, measures the rotations in the other direction. To use this form of the tropometer, it is only necessary to turn the instrument on its vertical axis until the zero point of the scale touches the edge of the cornea. Then observe through how many divisions of the scale that point on the cornea moves when the eye is rotated in a given direction, and we have at once that rotation in degrees. If it is desired to measure the excursion of the eye up or down, we turn the eyepiece so that the scale is vertical, and have the lid of the eye which is under examination lifted so that the edge of the cornea is distinctly visible. The rotations of the globe up and down are then observed in the same way as when in the horizontal plane.

When the ophthalmic microscope is thus changed into a tropometer, the subject, sitting in front of the instrument, ordinarily steadies the head by resting his elbows on the table, and supporting his chin on the palms of his hands. That is usually sufficient for clinical purposes. For laboratory work, however, or when special exactness is desired, it is well to use the head-rest already described (Fig. 117).

Of What Clinical Value Is a Knowledge of the Field of Fixation?—After devoting so much time to the discussion of instruments for measuring the field of fixation, and to the results obtained by them, we naturally ask—what of it? In order to answer this, let us presuppose for a moment an acquaintance with the pathological aspects of our study and recall the points which we desire to learn in any case of heterotropia—as, for example, in an abnormal convergence. We wish to know:

1. Does any deviation of one eye or both exist?
2. Which eye—if either—is especially affected?
3. Exactly which muscle or group of muscles is affected?
4. Is the deviation due to excessive contraction of the adductors (active esotropia), or to paresis of the abductors (passive esotropia), or is it due to both causes?

Some practitioners, it is true, do not take the time and trouble to ask these questions. For them it is sufficient to know that a deviation does exist; they recognize only the more evident forms, and usually make some operation promptly for all varieties. Such criminal carelessness requires no comment.

But when an attempt is made to answer any of these questions, too much dependence is often placed on the tests with double images, such as will be considered in the part relating to paralyses. But such tests, like subjective tests with the perimeter or with any similar instrument, have two important defects. They presuppose sufficient vision in each eye to recognize the test objects, and also sufficient intelligence in the subject for exact replies. Now the fact is that many of our cases are deficient in one or both of these qualifications—for example, most children, or uneducated adults, especially those of dispensary or hospital practice, and others unnecessary to specify here. Moreover, in all subjective tests, no matter how good the vision or how intelligent the patient may be, still another element, the personal equation, must be taken into account. Evidently, therefore, if we would obtain more than the most superficial knowledge of these important deviations, we must collect all the data we can by objective measurements. This applies not simply to the limits of the field of fixation, but to the rapidity with which the globe swings from side to side, to the lifting power of the adductors, and possibly also to the muscle sound—all of which are to be considered presently.

Having thus glanced at the reasons why the objective methods of examination are preferable to the subjective, let us ask more exactly in what way the measurements of the field of fixation enable us to answer one or more of the four questions already referred to.

1. As to determining whether or not a deviation does exist. When that is not always apparent, (heterotropia), but usually latent (heterophoria), the contraction or extension of this field may alone indicate the deviation. That may not be shown entirely by the limits of the field, but quite as much by the *behavior of the eye* as it approaches those limits, as already indicated. In this connection it is only possible to refer briefly to this diagnostic point.

2. Any difference between the limits of the field of fixation in one eye, as compared with the limits in the other eye, undoubtedly does assist very materially in the conclusions. Most of the tests with double images, especially those for determining the static position of the globe, do not show conclusively, and sometimes not at all, in which eye the difficulty lies. On the other hand, any one accustomed to make measurements of the field of fixation of each eye, will appreciate that in a considerable percentage of cases heterotropia is accompanied by a limitation of the field in one eye entirely, or at least in one, as compared with the other.

3. Almost as a corollary from the last statement, it follows that the limits of this field assist in locating the group of muscles, or even the principal muscle affected.

4. Finally, in cases of heterotropia the question always arises, does the eye before us deviate because it is drawn out of place by excessive traction of the group of muscles, or because of imperfect innervation of the opposing group? This question is so difficult to decide that we need the help of all the methods of investigation at our command. And in this,

measurements of the field of fixation apparently do assist, at least to some extent. For, in a given case of esotropia, if the eye can be turned outward the usual amount, or even more, then we are safe in assuming that the abductors have quite a sufficient innervation, and probably the esotropia is due to excessive action of the adductors.

INFLAMMATION OF THE EYES DUE TO INFECTION FROM HAY FEVER, CONVEYED BY TOBACCO SMOKE, WITH REPORT OF CASES.

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The subjects of this report consist of Mr. G., aged 52, his wife, two daughters, a son, two servant girls, and a visitor. Mr. G. is the subject of hay fever, which manifests itself at the accustomed time, usually from the 10th to the 15th of August each year. He has been a sufferer from this affection in its most severe forms for many years. He is an inveterate smoker, and for the past five years has, during the attack of hay fever, forced the smoke from his pipe up into the posterior nares, out through the nostrils, believing that this procedure gave temporary relief.

It was noticed, some time after he began this practice, that other members of his family became affected with a catarrhal conjunctivitis, more or less violent. Nothing was thought of the matter as having any connection with the hay fever, until the second occurrence. when it was remembered that they had all suffered from the eye trouble the year previous, during Mr. G.'s hay fever period.

I had treated the various members of the family for this affection, which yielded to mild collyria, principally of boracic acid solutions and the like.

At the second annual attack, the son was away from home on a visit, and did not suffer from the conjunctivitis. This was in 1903, but the remainder of the family, including the servant girl, however, suffered from the conjunctivitis. Now, that it was supposed to have some relation to the hay fever, and thought to be contagious, the most thorough and painstaking antiseptic precautions were enforced as soon as the first case of conjunctivitis appeared.

In 1904, the son and elder daughter spent their vacations at their grandmother's, in the eastern part of the state, during the father's hay fever attack, neither of whom suffered from the conjunctivitis; but the mother, younger daughter and the servant girl—not the one employed the previous year—all suffered from inflamed eyes. Besides these, a former playmate of the younger daughter, whose home is in a nearby town, made a hurried call at the house and simply walked into Mr. G.'s room, where he was smoking, to give him a friendly salute, also suffered from a very severe conjunctivitis a few days after returning to her home.

In 1905 the father, mother and son went to the northern peninsula of Michigan, where the father escaped the hay fever and the mother and son, as well as the remainder at home, all avoided the conjunctivitis.

I am fully aware that with the chaos of theories which are held regarding the etiology and transmissability of hay fever, that infection from it is not generally accepted, and that the contagion from it is held as not being liable to be transmitted to other than the nasal mucous membrane, and that not communicable from one person to another, yet it must be remembered that in the individual who is suffering from the affection it is often not limited to the nasal mucous membrane, but the conjunctival, buccal, pharyngeal and even that of the stomach and bladder have been observed to have become markedly involved. If a sound part of the body becomes inoculated with virus derived from an inflected part, it is not unreasonable to assume that it can be transferred from one patient to another.

Dr. Kinsman reports a case of infection from smallpox carried with the smoke of a burning straw mattress four hundred feet, whereon a patient had died from the disease. The mattress and other bedclothes were taken into the back yard the morning after the child's death and burned, the smoke from which entered the rooms of a house four hundred feet away. The rooms were so filled with the smoke that an investigation at the time was made as to its origin, when it was positively ascertained that it came from the burning bed on which the child had died. The consequence was that in the ordinary course of time two cases of smallpox developed and that there were no other known means of infection.

The important question at issue is not with special reference to the eye, but does tobacco smoke carry infection, and if so, as in the hay fever case, what does it do in other cases, and especially in that most dreaded affection—tuberculosis.

ON A RARE DEVELOPMENT OF A PINGUECULA, ALSO FROM AN ETIOLOGICAL VIEWPOINT.*

By W. Lohmann, M. D., Assistant.

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Translated from the German by Dr. T. T. Blaise,

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The following case of pinguecula, which was recently observed in the University Eye Clinic, by reason of its unusual construction, together with a peculiarity of the lids and palpebral fissure, brings to mind a long neglected factor, which in the etiology of pinguecula may have its bearing.

K. J., 69 y., Poliklin Journ. No. 6241, 1905.

Right Eye: =light perception; color perception and light projection good. Cataracta incipiens; atrophia nervi optici.

Left Eye: V. = $^5/_5$; s. c.; + 3.0 N.

In observing the eyes the most conspicuous feature is the large proportions of the palpebral fissure, measuring 30 mm. in length from the outer to the inner angle, while there is an appreciable difference between the width of the right fissure which measures 15 mm. and the left, with a width of 12 mm. when vision is directed straight forward. The lower corneal margin is 4 mm. above the lid margin on the right side, and 2 mm. on the left. The skin of the lower lids, which are below the normal height, is flabby and smooth, the delicate folds having disappeared.

Right eye (see cut): The conjunctiva bulbi, the posterior portion of which is moderately injected, presents the following interesting arrangement of the pinguecula. The same duplicates roughly in its entirety the configuration of the rima palpebrae. At the outer margin of the longest corneal horizontal diameter, it begins in the form of a narrow strip or line of 1 mm. breadth, coursing freely over the level of the mucous membrane and disappearing at the outer lid angle, which it meets when the eye is directed horizontally forward. The length of this portion is 10 mm. From this point the strip forms an acute angle downward, and runs thence almost parallel with the lower lid margin to the lower margin of the cornea, impinging closely upon the limbus corneae. From here to the acute angular, temporal turn, the length comprises about 15 mm. The pinguecular strip thus encloses a triangle, the base of which is formed by the lower outer quadrant of the cornea. The conjunctival structure between the two arms presents a distinct bluish red tone of color, due to the enlarged calibres of the conjunctival and episcleral vessels, being also hypertrophied in the apex of the triangle.

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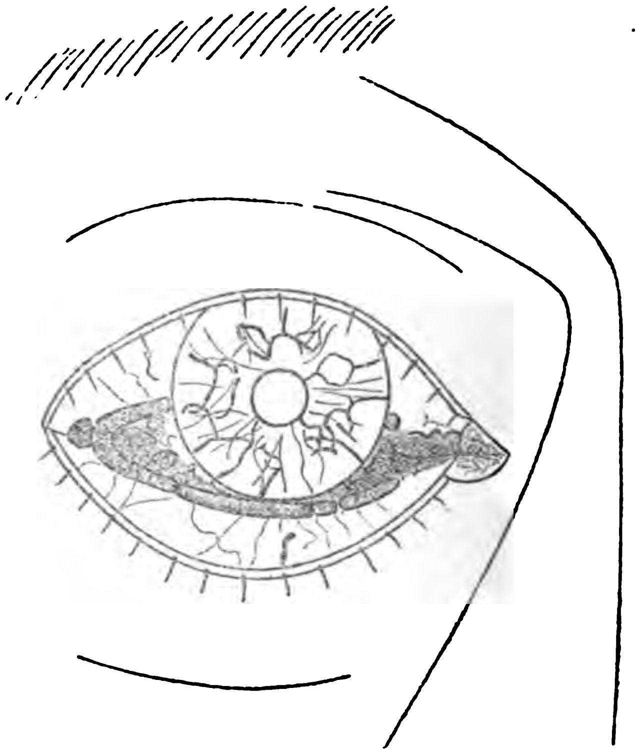
*Beitraege jur Augenheilkunde, 65, Heft, 1906.

The pinguecular strip now passes from the cornea inward in a course symmetrical with its exterior member. The length of this member is only 8 mm., so that its terminal point reaches, when vision is directed horizontally forward, not quite the lower punctum lachrymalis. At the inner margin of the longest horizontal diameter of the cornea is a pointed elevation which is not uniform in color with the balance of the pinguecula strip; while the latter has a yellowish, fatty appearance, the color of the former is more of a grayish white. The sides of the inner triangle, the base of which is formed by the lower



inner corneal quadrant, are not so perfectly constructed as are those of the outer triangle, however, the enclosed space of this described triangular space is likewise covered by a faint bluish, reddish part, ranging somewhat above the common level.

Left Eye: The arrangement of the pinguecula of this eye is analogous with that of the right eye, but has not reached as high a degree of development. A narrow, pinguecula strand 17 mm. long runs parallel with the lower lid margin, losing half of its breadth by coming in contact with the lower corneal margin at its longest vertical diameter. Here, too, there can be observed at some places punctiform indentations that correspond to the upper arm of the pinguecula strip of the other eye. The triangular space, on this eye, which is only partially enclosed by the pinguecula strip, is covered by a tissue, which, on account of its bluish-reddish tone of color, represents altered conjunctival tissue.

The effect of change as well as the weighing of the various features of the two factors, which are accepted as the cause of pinguecula, does not explain sufficiently every pinguecula. So, too, in our case, are neither the injurious influence of the atmosphere in any form, nor the accepted senile changes of the conjunctival vessels an adequate explanation. Even, if the two factors really are primarily causative in the development of the pinguecula, and we are forced to ascribe to the "weathering" influence of the atmosphere a considerable role, (patient is manager of a trainway), there, nevertheless, remains unexplained the question why the conjunctival changes are not more evenly blended, and why the pinguecula formation is of a striped nature, and in form and in its diminished vertical diameter is a faithful duplication of the palpebral fissure.

It is suggestable that when there is a narrowing of the palpebral fissure, that through its consequent pressure there can be maintained a venous stasis, which would favor the originating of a pinguecula. This view would explain why the pinguecula begins at some distance from the lid margin, and also why the peculiarly characteristic pinguecula is of striped (linear) formation. The venous stasis would naturally be greater at the periphery, *i. e.*, at the point where the pinguecula strip is located. The pressing effects of the lids directed persistently against the horizontal meridian of the eyeball can only be conceived as the sum total of smaller forces which only gradually effect a venous stasis.

The supposed reduction of the lid aperture and the firmer adhering of the lids to the ball, might be caused by the more frequent nictitation, one beat of which, as is known, consists of a brief, twitching (zuckend) reduction of the aperture in which the lid margins do not come in contact. In our case, we have the preconditioning features in support of both views: first, in the abnormal width of the palpebral fissure and the atrophy of the lower lid, whereby during nictitation a greater portion of the surface of the eyeball remains exposed, and next in the occupation of the patient which requires frequent and constant nictitation.

It has formerly been held that pinguecula was preceded by an active circumscribed hyperemia caused directly by irritating influences from without, but according to the above view the cause of the pinguecula consisted of a passive hyperemia brought about by the compressing and backward traction of the lids, and only indirectly by irritations from without.

I wish to express my heartfelt thanks to Prof. Eversbusch, my preceptor and teacher, to whom I am under obligation for the case and its publication.

ABSTRACTS FROM ANGLO-AMERICAN OPHTHALMIC LITERATURE.

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Extraction of Senile Cataract.

CRITCHETT, SIR ANDERSON, C. V. O., M. A., F. R. C. S. E., (*Ophthalmoscope*, March 1, 1906), after relating his personal experiences during his early career, where he had the opportunity of observing his father, as well as other prominent ophthalmologists, perform cataract extractions, describes his method of procedure as follows:

A case suitable for operation, in his opinion, is one where vision is lowered to such an extent that the patient's occupation is seriously interfered with, the question of ripeness not being an obstacle. If much soft cortical substance is anticipated, a preliminary iridectomy, five or six weeks previous to the operation, is done.

A few years ago Critchett used bichlorid for cleansing the eye, but later has had recourse to chinosol 1 to 6,000. At present he considers warm saline applications sufficient.

For over twenty years he has operated without a speculum, which he regards as unnecessary, and in some cases harmful, due to the strong leverage exerted, with consequent rupturing of the hyaloid membrane. An experienced assistant is employed to hold the lids apart with his fingers. After anesthesia is produced, the eye is steadied by short forceps grasped between the thumb and two first fingers, the ring finger being employed to elevate the lid.

He favors the fingers over the speculum, owing to the fact that should any straining take place, the lids could be released immediately. Critchett's knife is slightly different from the original Graefe. The point is central, followed by an immediate broadening. The back is beveled and the blade slightly rounded. He claims that it prevents a too rapid escape of aqueous, accomplishes a smooth section, and the iris is less likely to fall in front of the knife.

His section is made at the corneo-scleral margin, and embraces a conjunctival flap. The first onward and upward movement of the knife accomplishes three-fourths of the section, which is finished as gently and slowly as possible.

Critchett states he still adheres to the principles of eclecticism which he advocated in 1883. In an enfeebled patient or one suffering from diabetes, he refrains from making his section entirely in the cornea.

In immature cataract he makes a peripheral, rather than a central incision in the capsule. If the lens is quite ripe, he evacuates with a tortoise-shell spatula. Should there, however, be much soft cortex, he uses his finger on the lower lid, and perseveres until no gray cloud can be seen in the pupil.

The most careful manipulation is required by the glutinous or adhesive lens, this being more easily coaxed by a gentle rotary movement of the finger, rather than by direct pressure.

Dry dressings, light bandages and Cartella eye shields complete his operations.

Atropin is employed once or twice daily at the end of forty-eight hours. Should there be no pain, swelling or rise of temperature, he relies upon nature for the healing process, not examining the eye until the fifth day.

Critchett states that in his own and as well in his father's experience, serious harm results in not a few instances from too early and too eager interference.

He leaves the darkening of the room to the patient's wishes. For the first two nights a mild narcotic is given to insure proper rest.

In closing, Critchett mentions the fact that the personal factor is unduly dominant. F. C. P.

Extraction of Cataract in the Capsule.

HERBERT, H., F. R. C. S., (*Ophthalmoscope*, March 1, 1906), states that in the conditions obtaining in the Punjab, extraction in the capsule is probably warranted. In his opinion, the operation is not a conservative one, as unnecessary risks are taken, escape of vitreous occurring in skilled hands slightly oftener than in the operation as commonly performed. The amount lost, however, is small. Major Smith's percentage in 1903 was between 6 and 7 per cent. Captain Oxley had twelve losses in forty operations. Herbert contrasts these results with those secured by the regular operations performed at the Cowasjee Jehangir Ophthalmic Hospital, Bombay, where in five hundred and seventy-four extractions the escape of vitreous occurred in but fifteen, or 2.6 per cent.

He states that needling is, of necessity, performed ten days following extraction. His method is to use a very narrow, old Graefe knife introduced through the sclera close to the cornea. The point of the knife is caught in the bulbar conjunctiva and slid under, making the puncture subconjunctival.

Herbert agrees with Major Smith with regards to the absence of iritis after operations. In the Bombay hospital suppuration and severe iritis are extremely rare conditions. Out of 1,172 extractions there was only one suppuration, and in 800 more the latter complication was absent. In conclusion, he states that "not a scrap of evidence has been advanced sufficient to justify removal of transparent capsule, except under urgent circumstances." F. C. P.

Needling for "After-Cataract" and Its Attendant Dangers.

POWER, HENRY, M. B., F. R. C. S., (*Ophthalmoscope,* March 1, 1906), following some preliminary remarks, states that after needling, the clear pupil may become filled with lymph, destroying the results of a good operation. The membrane may be tough or the needle dull, causing, upon pressure, a rupture of the attachment, with a resultant hemorrhage and consequent diminution of vision.

He states that when blood has been effused, a tedious convalescence must be looked for, as well as an interference with the transparency of the capsule.

The late Mr. Critchett is quoted as follows: "Never, if you can help it, go into partnership with another man's unsuccessful operation, for you will surely be held responsible for any untoward result."

Other complications may be acute, and chronic iritis and glaucoma, which leave the eye in an unsatisfactory state.

Power concludes by mentioning the fact that needling is not a trivial operation.

He praises Mr. Treacher Collins for his illustrated contribution to the pathology of the eye, and in particular for his suggestion concerning the removal of the anterior capsule, which Herbert, himself, considers a very important improvement. All ophthalmic surgeons are advised to read the report in the Ophthalmic Hospital Reports. F. C. P.

On Some Points in Relation to Extraction of Cataract.

MARSHALL, C. DEVEREUX, F. R. C. S., (*Ophthalmoscope*, March 1, 1906), in his preliminary remarks, draws attention to the difficulty of sterilization of the conjunctival sac preparatory to cataract extraction. Referring to his own method, he states that he has not attempted extraction within the capsule. Preliminary iridectomy he considers superfluous. Both eyes must be cataractous (senile) before he will operate, as it has been his experience that the patient is never satisfied when a cataract has been removed from an eye whose fellow enjoys excellent vision. He cites a case where he enucleated twelve years ago for a painful eye following extraction, and puts the question whether or not this particular patient would not have been better off if no attempt at removing the lens had been done, as vision has remained so good in the unoperated eye, to say nothing of the danger of sympathetic ophthalmitis. Marshall remarks that within the last year two patients came under his observation, each of whom had had extraction performed upon one eye whilst the fellow eye was clear. Both operated eyes did poorly. One patient lost the sight of the good eye through sympathetic trouble, even after enucleation had been performed upon the operated eye. The other patient who had been operated upon nine months previously, presented himself with keratitis punctata and early sympathetic disease, the eye being almost blind. Enucleation was done, at which time the lens in the "good" eye was still absolutely clear. The disease subsided after some weeks of treatment, but the vitreous was left in such a condition as to render future extraction hazardous. Marshall's ideal technique consists in making a good, big incision with a large conjunctival flap. As the knife crosses the anterior chamber, the point is dipped into the lens capsule, then withdrawn and continued across to make the counter puncture. If aqueous is lost it is due to cutting upward at the time of crossing the anterior chamber. This, of course, should be avoided. He states that he seldom loses aqueous during the above procedure. The advantage of cutting the capsule with the knife lies in the fact that the point of the latter is sharper than the cystitome, and at this stage of the operation there is no bleeding to interfere. Expulsion of the lens is next in order without an iridectomy. Should, however, there be trouble in replacing the iris, a piece of the latter is excised to avoid prolapse, the iridectomy being no more difficult at this stage than before removal of the lens. In his experience he has found the greater number of patients who have $^6/_6$ vision, to be among those who have not had the iridectomy. In conclusion, Marshall states that iritis is infrequent, but should it occur, an iridectomy would be an advantage.

F. C. P.

Regarding the Loss of Vitreous in the Operation for Extraction of Cataract.

Drake-Brockman, E. F., F. R. C. S., (*Ophthalmoscope*, March 1, 1906), tabulates his results as follows:

(1) Pagenstecher's Operation.

Recoveries, "good vision"	194	or	66.21%
Recoveries, "fair vision"	83	or	28.32%
Failures	16	or	5.46%
Total	293		
Loss of vitreous	84	or	28.67%

(2) 3—Millimeter Flap Extraction with Iridectomy.

Recoveries, "good vision"	191	or	65.18%
Recoveries, "fair vision"	84	or	28.65%
Failures	18	or	6.81%
Total	293		
Loss of vitreous	17	or	5.80%

(3) 3—Millimeter Flap Extraction without Iridectomy.

Recoveries, "good vision"	220	or	65.08%
Recoveries, "fair vision"	60	or	20.81%
Failures	13	or	4.43%
Total	293		
Loss of vitreous	3	or	1.02%

Pagenstecher's operation was abandoned, owing to the greater loss of vitreous than was occasioned by the three millimeter flap operation. All the patients were hospital cases, and vision was tested ten days following the operation, the patients disappearing after leaving the hospital, making further observation impossible. Drake-Brockman believes in disturbing the eye structures as little as possible, and considers loss of vitreous to any extent detrimental. He almost invariably performs the three millimeter flap operation without iridectomy, as his table shows this to be the safest in his hands. Better vision is obtained and loss of vitreous is not so frequent. In concluding his remarks, he states that loss of vitreous in extraction in the capsule, is more liable to occur as greater pressure is necessary to extract the lens. In extraction with iridectomy, the support to the deeper structures is weakened, favoring the escape of vitreous, leaving extraction without iridectomy as the safest means, according to his idea. F. C. P.

The Treatment of Recent Embolism of the Retinal Arteries by Digital Massage.

Wuerdemann, H. V., Milwaukee. (*American Journal of Ophthalmology*, January, 1906). In October, 1901, the author reported two cases of recent embolism of the central retinal artery, in one of which all usual functions were restored to the normal, and in the other partly cured, by deep digital massage. To this treatment he ascribes the successful results. It permits a flow of blood past the obstruction and keeps up the retinal nutrition until sufficient absorption of the clot has taken place. In support of his contention as to the curability of the affection in the early stages, he presents clinical reports of cases by other writers in addition to his own, brief reports of which follow: P. M. O., aged 40 years, presented typical total embolism of the left central artery, which had come upon him the previous day. He gave a history of having had several attacks of transient, but not total blindness in the same eye during the previous year, but each time completely recovered his vision. The eye was massaged with thumb pressure. Ophthalmoscopic examination made immediately afterwards showed that some blood entered the retinal arteries, and that the disc became pink; sensation of light and form returned. Thereafter the treatment was massage twice a day, daily pilocarpin sweats and iodid of potash. This treatment was continued for some time, with widening fields and visual improvement. One year after his discharge, during which time he received no treatment, ophthalmoscopic examination showed an atrophic nerve, slightly cupped, the arteries very small, and accompanied by whitish lines of considerable thickness, which would be traced only two or three disc-diameters away from their entrance, the veins smaller and also showing sclerosis of their walls, the retina atrophic, and complete disappearance of the dark colored island which proceeded from the disk. The author considers this a rare example of accessory retinal arteries, which, being derived from the chorioid plexus, had a connection with the clot in the central artery. In this case he does not think the treatment was of the best effect, but that the partial restoration of function was due to the anomalous arteries. The following report is that of a successful case: B. K., aged 21, gave a history of sudden blindness, occurring six days before examination. The vision had slightly improved, and equalled $^2/_{40}$ in the affected eye. An ophthalmoscopic examination showed typical total embolism. Immediately forcible digital massage was practiced for about two minutes, after which the contracted arteries were seen carrying blood, the veins less dilated, and the patient expressed himself as seeing better; the massage was then continued about two minutes. He was given pilocarpin sweats, and iodid of potash. Hot applications were made to the eye for one-half hour on every third hour dionin (10 per cent.) was instilled twice a day for two days; on the third day the vision increased to $^6/_{24}$, and the visual field became larger. Returning three and one-half months after this first examination, his vision equalled $^6/_6$, and the fundus was nearly normal. The author's treatment consists in instilling two drops of 5 per cent. cocain or 1 per cent. holocain solution, a little vaselin is put into the eye, the operator stands in front of the patient, who is in a sitting or lying position, one hand is placed on the back of the patient's neck to steady the head, and the thumb of the other is pressed deeply between the eyeball and the wall of the orbit, the lids being closed, almost dislocating or gouging out the eye, then with a slow, rotary motion the thumb is passed round the eyeball, the pressure being suddenly released and then repeated. This process is kept up until the patient can stand the pressure no longer. The treatment is made three times a day at first, then twice, and then once daily. The electric vibrator was sometimes used after digital massage had been stopped. The suction vibrator was also used for the purpose of increasing the blood-supply to the optic nerve and retina in case of atrophy. All the patients had hot compresses one-half hour on every third hour during the day for the first week, from four to eight pilocarpin sweats, and large doses of iodid of potash for several weeks, being continued in smaller doses for a month or more. He strongly recommends forcible, deep, digital massage as the main hope of relief for recent embolism. H. G. G.

Spontaneous Hemorrhage Into the Vitreous.

SCHNEIDMAN, THEODORE, (*American Journal of Ophthalmology*, January, 1906), reports the following case: Mrs. A. B., aged 47, awoke one morning blind in her left eye; she was quite sure the difficulty had come on since retiring the night before. On the same day an examination showed that the vision was reduced to light projection. The fundus reflex was abolished, masses with a reddish tinge could be recognized in the vitreous. This condition has remained almost the same for three months, very little improvement having taken place. The patient has no organic disease. The writer is at a loss to explain the cause of the extensive hemorrhage, which he suggests might have been caused by the extraction of a tooth the day before, although there was nothing unusual about the operation. This second case was a young man, aged 21, who complained of the sudden appearance of a cloud before the left eye. Everything "looked red." An examination showed a cloudy vitreous preventing a view of the details of the fundus. This opacity cleared up rapidly, so that at the end of a few weeks the media had become quite clear while two separate hemorrhagic regions were visible in the retina. In this case, too, nothing could be discovered in the general condition, or the ocular structures to account for the bleeding. H. G. G.

Advantages and Disadvantages of Glasses in Railway Service.

BLACK, NELSON MILES, Milwaukee, Wis., (*American Journal of Ophthalmology*, February, 1900). From the writer's experience of riding over six thousand miles in the cabs of engines, in all kinds of weather, and at all times of the day and night, he gives the following opinion: That a railroad employee (engineman or fireman) who has been in continued service for a period of not less than five years, and who on examination falls below the required standard of vision, and such vision can be brought up to said required standard with glasses, his color perception meeting the required standard, and there being no ocular disease, is a safe employee. Such employee should be required to carry at least one extra pair of glasses; such employee should be examined semi-annually to ascertain if there has been a further decrease in vision, and if the glasses fully correct the visual defect. The objection raised to enginemen wearing glasses are not many, but, on first thought, may seem serious.

1. Becoming smeared and dirty.
2. Becoming covered with fog, mist, rain or snow.
3. Becoming fogged on coming from cold into warmth.
4. The danger of glasses being broken.
5. That glasses which give a visual acuity of $^{20}/_{20}$ in the examining room, do not give an equivalent visual acuity of $^{20}/_{20}$ when used at very long ranges, particularly under certain climatic conditions.
6. The legal aspect in case of accident.

The writer takes up each of these questions, which he treats in the following manner:

1. Objects at long distance are hardly interfered with, and the dirt not being evenly distributed over the surface of the glasses, vision is permitted through innumerable small, clear areas.

2. Practically the same answer may be made to this question, and the use of the "losire" pencil has been found sufficient in preventing fogging.

3. The writer's experience has shown that less than five seconds after putting the head out of the window in the cold is needed to clear the classes of the fog.

4. This danger is practically nil; he recalls only one instance.

5. If vision in the examining room is found to be reduced to $^{20}/_{40}$ in each eye, or $^{20}/_{70}$ in one eye and $^{20}/_{50}$ in the other, and can be brought up with the glasses to $^{20}/_{20}$ in each eye separately, "he certainly is safer as an employee with his refraction properly corrected, than he would be without such correction."

6. That vision is better without correcting lenses at dusk or darkness, is asserted by well known authorities.

7. This is taken advantage of by accident lawyers and should be overcome by conventions of oculists and men expert in this calling.

As distinct advantages in wearing glasses, the writer mentions:

1. The correction of refractive errors of men long in service.
2. Protection against wind, mist, rain, snow and sleet.
3. Relieving the reflection when running beside rivers and lakes, from snow in the winter, and sand in the western deserts.
4. Overcoming the disturbances of vision when running toward the rising or setting sun.
5. Doing away with the heat and glare from the firebox in stoking.

Then follows an appended report of the opinion of ophthalmologists throughout the United States as to the safeness of an employee requiring the use of glasses in railway service. A request was sent out by the writer comprising the following questions:

1. Would you consider a railway employee a safe man, as far as his vision is concerned, who has been in continuous service for not less than five years, and on examination his visual acuity was found below the required standard, there being no ocular disease, color vision meeting requirements, and his vision being raised to the required standard by the use of glasses?
2. Should there be a minimum standard of dimunition of vision for employees in this class?
3. What would you consider the minimum amount of vision such an employee should possess to be promoted in service with glasses bringing his vision up to required standard?
4. How often, in your opinion, should men falling in the above class be examined to ascertain if there be a further loss of vision and determine if the glasses fully correct the defect?
5. Approximately, what percentage of spectacles in your experience are broken by accidental or other means while on the wearer's face?
6. Can you consistently agree with the opinion given above?

There are some answers from railroad surgeons and some from railroad officials. All the answers are appended to the paper, 463 affirmative answers were given to 22 negatives, and several with certain exceptions or provisions. The conclusions are:

1. That the protection afforded by glasses is a distinct advantage to enginemen and firemen.

2. That the disadvantages of glasses in railway service are not sufficient to render an employee unsafe who wears them for protection, or to correct a latent refractive error made manifest by increasing age.

3. That wearing glasses for protection of the eyes in railway service will tend to prevent the reduction in vision usually found occurring in enginemen at 40 to 50 years of age.

4. That the only method of eliminating glasses for distance

in railway service in the future, is to have all applicants for employment examined for latent refractive errors when they apply for the position by men scientifically trained for such work.

5. That it is the consensus of opinion among the ophthalmologists of the United States that an engineman or fireman wearing glasses on duty is as safe an employee as one without them, if not safer. H. G. G.

A Yellow Peril.

CROSKEY, JOHN WELSH, Philadelphia, (*Medico-Chirurgical Journal,* May, 1906) calls attention to the danger of introduction of cases of trachoma into this country. He says:

"I allude to trachoma, a contagious eye disease. It is a well established fact that this disease is more prevalent in Japan than in any other country. It is common also in India and Egypt as well as other eastern countries, but from all reports of a dependable nature, the percentage of cases is higher in the Kingdom of the Mikado than in any other country.

"This seems strange when one thinks of the cleanliness of the Japanese, as a nation, for trachoma, like most contagious diseases, is fostered by dirt and neglect of the person. But in Japan, the very cleanliness of the people becomes a menace and a means of propagating the disease. Like all eastern people the Japanese pay great attention to their religious observances and one of the first requisites for those who go to the temples of worship is the performance of ablutions, so that they may enter the temple undefiled. To enable the people to perform this cleansing process, basins of water are always in place in front of the temples. In these the people wash. But there the provision for cleanliness seems to come to an end. Above each basin is suspended a towel. One towel, on which hundreds of successive worshipers are expected to dry themselves, before entering the temple. The result may be imagined. The towel soon becomes foul and is reeking with the germs of all the diseases from which the five or six hundred bathers may be suffering."

"I do not wish to bore my readers with statistics, but a few figures will be of use in showing how serious this threatened yellow peril is. During the fiscal year ending June 30, 1905, there were 1,026,499 aliens inspected at the ports of entry by officers of the United States government. Of these 821,103 arrived at the port of New York and out of this number it was found necessary to deport 573, because they were found to be afflicted with trachoma. Of the 24,319 immigrants inspected at the port of Philadelphia during the same period only 72 were refused admission on this score.

"At San Francisco, where the Japanese nearly all land, there were only half as many immigrants as in Philadelphia, that is 12,580, but of these more than 200 were found to be suffering from the disease and were sent back to their own country. At

Seattle out of 1951 there were 21 sent back, and at Tacoma out of 886 it was necessary to refuse admission to 26."

Croskey calls attention to the fact that trachoma patients are encouraged to deceive the inspecting officers of this country. "In Japan, at one of the ports from which large numbers of emigrants are sent to America, a hospital is maintained by the emigrant agents for the treatment of cases of trachoma or suspected trachoma. This institution is not for the permanent cure of the disease, but merely to treat it temporarily and so obscure the symptoms that it will be more difficult to detect. At this hospital a preparation known as Adrenalin is used, which obscures the disease, thus allowing the intending emigrant to pass the inspectors and embark. With the conditions existing in the steerage of such ships, all favorable to the spread of the disease among other passengers, it is not surpriing that many cases of incipient trachoma are discovered at the port of landing.

In Liverpool, it has been learned, that not a few of the emigrants take the treatment with Adrenalin solution for trachoma, paying two pounds for the application. Many of them are also supplied with a sufficient quantity of the solution to keep up the treatment until they are landed on this side. When Adrenalin has been used, particularly if the treatment is kept up on board ship, it is extremely difficult for even the expert ophthalmologist to make a diagnosis. How much more difficult must it be for a young physician, who has had little opportunity to become familiar with the disease. And as a general thing the examining physicians are young men, just out of the schools, with little experience.

I am doubtful also if many of the examining physicians appreciate the extremely contagious character of the disease. I have seen a physician examining immigrants, after detecting a case of trachoma, pass on to the next candidate for admission and make another examination without any sterilization of his hands. Such carelessness is almost certain to spread the disease among those who would otherwise escape it and a fresh case is manufactured at the moment of landing."

Vitreous Opacities in Young Girls.

KIPP, C. J., Newark, N. J. (*Journal A. M. A.*, June 16), quotes Hirschberg's reference in regard to certain enigmatical white tissue formations in the lower anterior portion of the vitreous body in girls and young women. Two cases are reported in which only one eye was affected, and Kipp remarks that such cases are probably not uncommon and have doubtless been observed by most ophthalmologists. He reports a third case, however, in which the condition, coming on during good health, was extensive in both eyes, causing practical blindness for a time. The opacities, however, gradually disappeared and vision was restored, though latterly cataractous symptoms have intervened in from 20 to 25 years after the first condition was observed. Kipp thinks that there were probably hemorrhagic effusions in the vitreous from the ciliary body antedating the opacities. The condition in this case so closely resembled retinal detachment as to deceive an experienced specialist. The participation of the chorioid in the morbid process was shown by the appearance of an atrophic spot.

The Operation for Cataract.

CHENEY, FREDERICK E., Boston, (*Boston Medical and Surgical Journal,* April 5, 1906). Cheney contributed a very practical article which is filled with good suggestions. He uses a 1 per cent. solution of holocain; tries to confine the corneal cut to the limbus; makes a good sized corneal incision, and prefers the combined operation. His iridectomy is a small one. Regarding the delivery of the lens he says: "When the lens is a third or more delivered, the well-known method of having an assistant rotate it laterally with the iris forceps or some other instrument will often help one out of the difficulty." He does not favor irrigation of the anterior chamber. He prefers the old Berlin knit bandage. In the after treatment he uses atropin and a 25 per cent. solution of argyrol, at each dressing.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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The Ocular Changes in Leukemia and Pseudo-Leukemia.

Stock, (*Klinische Monatsblaetter fuer Augenheilkunde,* April-May, 1906), recognizes the clinical forms of luekemia as follows:

1. Chronic forms of leukemia.
    - (*a*) Lymphoid leukemia.
    - (*b*) Myeloid leukemia.
2. Acute leukemia.
    - (*a*) Lymphoid.
    - (*b*) Myeloid.
    - (*c*) Leuko-sarcoma.
3. Pseudo-leukemia.
4. Lympho-sarcoma.

Lymphoid leukemia is characterized by an absolute, or a relative, increase in lymphocytes, together with the general clinical symptoms. Myeloid leukemia is characterized by an increase in the blood of the bone marrow-forming elements. The acute leukemias differ only from the chronic by their rapid progress. These cases, aside from the blood changes, are likely to be mistaken for cryptogenetic septicemia. A pseudoleukemia are considered those cases which run the clinical course of leukemia, but in which the blood remains without characteristic change. These cases are rare, as the blood, although for a time normal, will usually become later typically leukemic. Many authors are therefore inclined to discard the term pseudo-leukemia, and consider that so-called condition a form of chronic leukemia.

The Fundus Changes in Leukemia.—The first clinical description of a leukemic retinitis was given by Liebreich. The pathological changes seem to be in the retina and in the chorioid. The retinal veins are very broad and tortuous; the vessels present varicosites.

The varicose dilatation of the veins, Murakami attributes to a leucocytosis of the blood. Masses of leucocytes adhere to the vessel wall, retarding the stream and causing stasis. The flow of blood may be so retarded, that the blood can be *seen* streaming in the retinal vessels (Grunert).

The stagnation results in over-distension and twisting of the blood vessels. Minute varicosities become filled with leucocytes and give the ophthalmoscopic appearance of light colored foci. Diapedesis follows, and white as well as red corpuscles are found free in the retina (Murakami). Whether or not there is proliferation of the lymphoid cells has not been definitely determined.

Lazarus believed that these typical fundus changes were only found in *lymphoid* leukemia, but Stock supplements this statement by evidence that they may also be found in myeloid leukemia.

A differential diagnosis between lymphoid and myeloid leukemia cannot, however, be made by the character of the fundus changes.

Opinions differ as to the explanation of the light yellow fundus of leukemia. Further observations must be made relative to the percentage of hemoglobin in the blood of these cases, as well as in those with normal appearing fundi.

Schmidt-Rimpler, and later Meller, concluded that the cause of the yellow fundus was the reduction of the hemoglobin. The thin layer of blood in the capillaries, reduced in hemoglobin, gives rise to the yellow color. Opposed to this theory are the cases of leukemia, with a very low percentage of hemoglobin, in which the color of the eye-ground remains normal.

Murakami, for example, reported a case with hemoglobin 30 per cent. the color of the eye-ground remaining normal, while Deller had a case with 40 to 42 per cent. hemoglobin, and a light yellow fundus.

Stock examined pathologically the eyes of a patient dead of myeloid leukemia; such a case as von Sternberg recognizes as leuko-sarcomatosis. The chorioid around the papilla was two or three times the normal thickness. In so much as the thickening was due to infiltration of leucocytes, the color of the thickened chorioid should have been gray or grayish red, and if the theory be accepted that the normal red fundus is due to the blood in the chorioid capillaries, the infiltrated chorioid should give a corresponding ophthalmoscopic appearance. Meller and Kerschbaumer, however, observed cases with similar chorioidal infiltration, in which a change in fundus color was not detected.

Acute Leukemia.—This is mostly of the lymphoid type, and the fundus changes have been but little described. Elschnig considers as characteristic, broad and torturous veins, arteries thicker than normal, hemorrhages, and a diffuse haziness of the retina. These changes he observed in a clinical case. In the case of acute leukemia reported by Stock there was a few days before death a general staphylococcus infection, which is not an infrequent complication in forms of leukemia. Stock attributes the light yellow fundus in his case, as Elschnig does in his, to edema of the retina, which was undoubtedly found, and which both authors regard as characteristic of acute leukemia. The torturous vessels, so characteristic of chronic leukemia, are not so constantly found in the acute form, and were absent in Stock's case.

Stock reports a case of leukemia which, for a long time, presented only the clinical picture of pseudo-leukemia, especially the variety described by Axenfeld as the "facial type." There was early disturbance of the face and visual organs. Another case is reported, which, starting clinically as pseudo-leukemia, terminated as lympho-sarcoma of the orbits. W. T. S.

The Cataract Operation of Antyllos.

HIRSCHBERG, J., (*Centralbl. f. prakt. Augenheilk.*, April, 1906), translates certain abstracts from the codex al-hawi, dealing with cataract operations as practised by the Arabian physician Antyllos.

C. L.

The Metallophon, an Apparatus for the Detection of Metallic, Other Than Iron, Foreign Bodies in the Eye.

WEISS, K. E., (*Centralbl. prakt. Augenheilk.*, April, 1906), describes an apparatus, which he has had constructed. The principle rests on the fact that metallic bodies are better conductors of electricity than non-metallic. The presence of such a body in the circuit will cause the current to flow more freely, which fact is made audible by means of a receiver held to the ear. A very weak current must be used, and the author admits that the instrument is very delicate and to be regarded rather as the first step in the right direction in determining the presence of intra-ocular metallic substances.

C. L.

Parinaud's Conjunctivitis.

HOOR, (*Klinische Monatsblaetter fuer Augenheilkunde*, April-May, 1906). I nthis lengthy paper, Hoor reviews thoroughly the literature of this disease and adds thereto a fully described case, the forty-fourth thus far reported.

Parinaud, in 1889, published his first account of this disease which he based upon three clinically observed cases. He described in it as an "infectious disease of the conjunctiva, which always led to glandular suppuration, and which appeared to be transmitted from animals to man." Parinaud further gave the symptomatology as follows: "The disease at first look has the appearance of acute granular conjunctivitis (trachoma). Red and yellowish vegetations are seen on the conjunctiva, which at first are half transparent, and later become opaque. They may reach the size of a large pin head. Between the larger granulations are numerous small yellowish granulations. Conjunctival tuberculosis may be suggested. In one case the granulations were limited to the upper tarsus; in the other two cases, both tarsi were invaded as well as the fornices, and a portion of the bulbar conjunctiva.

The cornea shows absolutely no tendency to take part in the process. The secretion is viscid and contains fibrinous flocculi; purulent secretion is never found. The lids are swollen and tense. The pre-auricular glands rapidly become the seat of inflammatory swelling; the neck glands may also become involved. The patient generally has a low grade irregular fever. The inflamed conjunctiva and swollen glands cause little pain. The conjunctivitis tends to spontaneous healing without scar formation within four to five months.

Application of silver nitrate retards the eruption of the granulations, but does not seem to lessen the course of the disease. The swelling in the region of the parotid diminishes about the fifth week, but the glandular enlargement persists, and very gradually disappears or passes into slow suppuration.

The suppuration of the glands proves the infectiousness of the disease and is quite characteristic, in that while other ocular affections are accompanied by swelling of the head glands, suppuration of the same is extremely rare.

Parinaud's conjunctivitis is almost always unilateral. Out of thirty-five cases it was so in thirty-two, and in only three cases was it bilateral. A negative characteristic of the disease is that the cornea even in the severest cases is seldom involved. Only twice in thirty-five cases was the cornea affected; in one case there was a pannus, and in the other, round infiltrations which disappeared completely within two weeks. Another negative symptom of Parinaud's conjunctivitis is the fact that notwithstanding the severity of the attack, and its long duration, cicatrization of the conjunctiva never follows. On the contrary, after the disease is over, the conjunctiva is perfectly clear and normal. This distinguishes it from trachoma, tuberculosis and syphilis of the conjunctiva. According to Hoor the average duration of the disease is three months; the shortest time was three weeks, and the longest time one year.

The glandular swelling is upon the same side as the conjunctivitis and may disappear either by resorption or suppuration. In the latter case, after rupture or incision the wound heals rapidly and smoothly. Parinaud at first thought suppuration was constant, but Hoor's investigations show that in 29 cases, the glands suppurated 12 times and underwent resolution without suppuration 17 times.

The pre-auricular glands are the most often affected, then the parotid glands, the sub- and retro-maxillary glands, and finally the cervical glands. In one case, aside from these, the axillary glands and inguinal glands upon the side of the affected eye became enlarged. Children and young individuals are more often attacked. In 31 cases, 8 occurred at 10 years and under; 7 between 10 and 20 years; 6 between 20 and 30; 4 between 30 and 40; 3 between 40 and 50; and 3 between 50 and 60 years. Thirteen of these cases were females, and 18 were males.

With regard to etiology Hoor found that in 65 per cent. of cases, the possibility of infection through animals was established, and in 35 per cent. it was not.

Differential Diagnosis: This must be made from granular syphilitic conjunctivitis, tubercular conjunctivitis, trachoma, follicular conjunctivitis and spring catarrh. In granular syphilitic conjunctivitis the anterior segment of the uvea is always involved. This is shown by contracted pupil, hazy cornea, discolored iris, posterior synechiae, etc. These symptoms are not present in Parinaud's conjunctivitis. Glandular enlargement in syphilis is bilateral; in Parinaud's conjunctivitis it is unilateral.

Conjunctival tuberculosis—Parinaud's conjunctivitis can only be mistaken for that form of tuberculosis which was described by Sattler, Mitvalsky, Rhein and others, in which the conjunctival tuberculosis took the form of abscesses, surrounded by grayish nodes in the conjunctiva. Even in these rare cases, the development of the disease is slow and gradual; without fever or chills; and the glandular involvement is indolent, the secretion is glairy, and the cornea is frequently attacked.

From *trachoma* Parinaud's conjunctivitis is easily differentiated; there is no prodromal or incubation period in trachoma. Locally there is diffuse infiltration in the fornices; the granulations in trachoma are on the average small, and the glands are not swollen.

The further course of Parinaud's disease makes the diagnosis certain from these three affections; the cornea is not affected; no corneal abscess or pannus; no scar formation in the conjunctiva. In follicular catarrh the follicles are transparent; there is but little swelling in the conjunctival folds, and no glandular swelling. Spring catarrh generally shows the characteristic changes in the bulbar conjunctiva.

The prognosis of Parinaud's conjunctivitis is favorable.

W. T. S.

A Contribution to Parinaud's Conjunctivitis.

St. Bernheimer, (*Klinische Monatsblaetter fuer Augenheilkunde*, April-May, 1906). St. Bernheimer reports a case of Parinaud's conjunctivitis in which he had an opportunity to examine microscopically a large piece of the conjunctiva including the tarsal portion. He calls attention to certain differences from the accepted investigation of Verhoeff and Derby in 1904. These authors found the underlying pathologico-histological change in Parinaud's conjunctivitis to be cell necrosis in the sub-conjunctival tissue due to an extensive infiltration of lymphoid and phagocytic cells. Following this is a chronic inflammatory reaction in the deeper tissues of the conjunctiva, which leads to organization and the formation of connective tissue. Aside from these changes St. Bernheimer found extensive changes in the endothelium of the vessels, resulting even in complete obliteration of the lumen. The tarsus remained throughout the long continued process entirely free. This is a positive distinction from trachoma, which at times clinically resembles very closely Parinaud's conjunctivitis.

W. T. S.

Traumatic Pupillary Inaction.

Dreyfus, (*Muenchener medizinische Wochenschrift*, February 20th, 1906). According to Dreyfus, observations made on the clinical and anatomical material offered by tabetic and paretic individuals clearly indicate some connection between the Argyll Robertson pupil and the spinal cord. Thus both Wolff and Gaupp have shown in the case they examined, that where an Argyll Robertson pupil was present, degenerative changes were found in the posterior columns of the upper cervical cord, and Reichard, extending these investigations with the purpose in view of determining the exact location of such centers, was able to make out a characteristic degeneration of the posterior columns between the columns of Gall and Burdach, extending from the second to the sixth cervical vertebra. To fully comprehend this connection, however, Dreyfus considers more observations necessary on cases other than of the class mentioned above, but of course retaining the lesions in the upper cervical region. The proximity of this center to the origin of the phrenic nerve is one reason why this sign often eludes observation, often no pupillary disturbance being noted until just before death when it is a premonitory signal of respiratory paralysis.

Dreyfus further reports a case with autopsy, of fracture of the cervical vertebrae, with destruction of the third cervical segment of the cord, the symptoms including a flaccid condition of the upper extremities, with spasticity of the lower extremities, dyspnea, areas of anesthesia, etc., followed by miosis and Argyll Robertson pupil. Vision was unaffected, and there was no external ocular palsy. Pathological study excluded any cerebral lesion, everything in fact, (the position and the pupillary inaction coming on synchronously with progressive paralytic changes) pointing to a case of spinal pupillary inaction.

Unfortunately the ocular motor region was not examined histologically, nor was convergence tested.

A. C. S.

Affections of the Eye Due to Auto-Intoxication.

ELSCHNIG, (*Muenchener medizinsche Wochenschrift,* October 10th, 1905). Elschnig takes exception to Groyer's article in the *Muenchener medizinische Wochenschrift* No. 39, at the same time defining his own position in this line of research. To amphasize this point he contributes the following abstract of his paper read by him at the Congress of German Naturalists and Physicians in Merau:

Auto-intoxications play an important part in: 1st—diseases of the nervous system; (internal ophthalmoplegia), diseases of the optic nerve, including tobacco and alcohol amblyopia.

2nd. In diseases of the cornea and sclera including relapsing keratitis, scleritis, and episcleritis periodica fugax.

3rd. In diseases of the uveal tract, especially relapsing iritis and iridocyclitis. In many of the latter there are signs of hereditary lues present, but antiluetic measures are of no avail, while dietetic regulations with disinfection of the alimentary canal often bring about a cure.

Alypin: Its Uses in Ophthalmology.

NEUSTAETTER, (*Muenchener medizinische Wochenschrift,* October 17th, 1905). As to the anesthetic properties of this drug, Neustaetter's observations are somewhat at variance with those of Impeus; the latter achieving complete anesthesia of the cornea with a 1 to 2 per cent. solution, while Neustaetter, in some cases was compelled to use 5 to 10 per cent. solutions. Five per cent. solutions were often found inefficient to remove foreign bodies from the cornea, and at no time did he see the complete anesthesia which follows the use of cocain. Nevertheless he admits it has properties which make it superior to cocain, in that no pupillary disturbance is produced, it is less toxic and it is cheaper. Neustaetter also reports favorable results from its use in hay fever, its non-toxic properties permitting the frequent use of the drug. Not interfering with the size of the pupil, Alypin may find a place among the therapeutic measures for glaucoma.

A. C. S.

Additional Observations on the Utilization of the Auricular Cartilage in Defects of the Lid.

BIRCH-HIRSCHFIELD, (*Muenchener medizinische Wochentschrift,* October 24th, 1905). Birch-Hirschfeld gives Buedinger credit for originating this method, Mueller whose method

Elster and Haass describe in the *Muenchener Wochenschrift*, September 19th, 1905, as a new method, not publishing his results (obtained independently) until almost a year later.

Birch-Hirschfeld reports the following cases in which he resorted to the Buedinger operation: Melanotic sarcoma of the lid, tuberculosis of the tarsal conjunctiva, partial symblepharon, congenital distichiasis with coloboma of the upper lid, and several cases of epithelioma of the lid.

The functional and cosmetic results were very gratifying. In one of the cases, a part of the cartilaginous flap separated causing a corneal ulcer. To forestall such complications, Birch-Hirschfeld now makes the cutaneous portion of the flap much longer than the cartilaginous portion, and sews the outer skin covering to the skin from the ear, thus enclosing the cartilage in a cutaneous envelope. He objects to Mueller's operation, partly because it limits itself to cases in which a part of the fornix and tarsal conjunctiva still remain, and to cases where there is no outer skin covering, and what he particularly considers a disadvantage is the resulting marginal excrescence which predisposes to corneal complications.

A. C. S.

Supplement to "New Operative Methods of Restoring Defects of the Lid by Means of the Complete Transplantation of Part of the Auricular Cartilage."

Elster and Haass, (*Muenchener medizinsche Wochenschrift*, October 24th, 1905). Elster and Haass regret their oversight in neglecting to mention Buedinger's operation, devised and published some time before Mueller originated his operative procedure.

They consider the Buedinger operation more complicated inasmuch as it usually necessitates two flaps, one from the ear and one from either the cheek or forehead, the latter often causing disfigurement and likely later to undergo contraction.

In Mueller's operation, the defect is replaced by one flap, a flap including the whole thickness of the auricle, one cutaneous surface forming the tarsal conjunctiva, the other the external skin covering.

A. C. S.

A Contribution to the Symptomatology of Barlow's Disease.

Schlesinger, (*Muenchener medizinsche Wochenschrift*, October 24th, 1905).Schlesinger reports a case of Barlow's disease of particular interest because the subperiosteal affection usually occurring at the distal end of the femur was found in the proximal diaphyseal region, and what is of more interest to ophthalmologists, the disease began with an orbital hematoma. Both orbits rapidly became invaded, the course of the disease being characterized by a series of recurring and subsiding hemorrhagic processes. No changes were noted in the fundus.

Orbital hematoma, while a rare symptom of Barlow's disease may be the only apparent symptom, as in a case described by Barlow himself. It more often develops suddenly during the course of illness and only in exceptional cases do both orbits become involved simultaneously.

Ecchymotic conditions of the skin or conjunctiva should not be confused with the typical Barlow retro-bulbar hematoma, associated with proptosis, deviation of the eyeball, and edematous and suffused lids. Meyer in an autopsy found subperiosteal hemorrhages in the orbit, with periostitis and parostitis.

A. C. S.

The Detection of One-Sided Simulated Defective Vision.

SCHMEICHLER, (*Wiener klinische Wochenschrift,* November 16th, 1905). Schmeichler's general plan of procedure is based upon the pretended examination of the sound eye, weak spheres being placed in front of that eye followed by the substitution of a plus twenty sphere compelling the patient to read with the acknowledged defective eye. Though an old method, Schmeichler claims brilliant results from it, if followed out according to the rules he has adopted.

The simple plan referred to above answers in many cases. If the patient fails to read with a plus twenty sphere before the good eye, a minus twenty sphere should be added, and if he still refuses to read, the malingerer is discovered. If the method thus far does not yield results, the eyes should be examined in the dark room and the correcting lens, and a strong plus sphere should be quickly placed before the defective and sound eye respectively.

The physician should not begin his examination by testing the eyes separately, as the patient during the course of the subsequent examination will try and close one or the other eye to make sure not to contradict his previous statements. If blindness is simulated in an eye nearly blind, this method is of little value, and if in addition, poor sight is pretended in the other eye, methods for the detection of feigned binocular vision must be resorted to.

The Application of Bier's "Passive Hyperemia" Treatment to Diseases of the Eye.

RENNER, (*Muenchener medizinsche Wochenschrift,* January 9th, 1906). This method of treatment consists of constricting the vessels of the neck by the use of a rubber band. Renner considers this treatment as particularly available in persons under forty; in older individuals an acute glaucomatous attack might be precipitated, and besides, such individuals are more prone to the formation of thrombi, the congestion produced favoring such a formation. All acute inflammations of the uveal tract are contra-indications to Bier's treatment.

Renner reports five cases of interstitial keratitis of from two months' to several years' duration subjected to this method with favorable results. The instillation of tinct. opii in one eye in three of the cases had no effect in hastening the process of absorption. The treatment was continued about four weeks, the rubber band being kept about the patient's neck constantly six to twelve hours at a time. This was repeated daily.

Less satisfactory results were obtained in cases of ulcus serpens; in conjunction however with other local medicaments the disease not only terminated more rapidly but ran a more favorable course. In plyctenular and catarrhal ulcerations, and in old corneal opacities no important observations were made. Renner claims no deleterious effects either local or general from this form of treatment.

A. C. S.

Vaccinia of the Eye.

ALEXANDER, (*Muenchener medizinische Wochenschrift,* March 13th, 1906). Alexander reports a case of vaccinia in a child involving the face, head, one hand and leg, and with pustules also on the skin of the lower fornix. The limited distribution of the infection suggested that the case was not a generalized vaccinia arising from toxic products in the blood current, but rather an auto-inoculation most likely induced by scratching, an eczematous condition of the face predisposing to such an infection.

The disease generally manifests itself as a vaccinia blepharitis, true pustules in this region being rare. Occasionally the process spreads to the conjunctiva. Healing invariably results without scar formation. Invasion of the corneal structure leads to graver complications; marginal ulcers may form, or a keratitis profunda post vaccinilosa may set in, a condition much resembling Fuchs's keratitis disciformis. Prophylaxis is the most important therapeutic measure.

A. C. S.

Two Cases of Cataract Caused by Lightning.

GUZMAN, (*Wiener klinische Wochenschrift,* April 19th, 1906). In one case a stationary partial cataract of both eyes resulted, in the other there were slight opacities in the lens of one eye, with complete cataract in the fellow eye. The latter was subjected to operation during which cortical matter was seen to escape immediately after the withdrawal of the lance knife, and before the capsule had been encroached upon, the premature escape of lens substance according to Guzmann being favored by a pre-existing capsular lesion traceable to the lightning stroke, this subsequently developing into an actual rupture of the capsule with cataractous transformation of the cortical substance. This theory has had many supporters.

Leber believes the physical chemical action of the electric shock to be an important casual factor. Recently Hess has shown that the opacities arise from the destruction of smaller or larger groups of epithelial cells resulting in faulty lens nutrition.

In the case operated on, in addition to symptoms of traumatic hysterical neuroses there was present beginning optic atrophy, progressive in type and especially pronounced in the operated eye.

Saemisch, Pagenstecher, Laker and Buller found cases in which there was optic neuritis; Reich, Downar and Laker describe retinal hemorrhage; Laker also saw a case of chorioidal rupture. Leber and Vossius, Knies and Treacher Collins report cases of optic atrophy.

A. C. S.

Neuro-Myelitis Optica.

KERSCHENSTEINER, (*Muenchener medizinische Wochenschrift,* April 24th, 1906). Kerschensteiner reports a case of neuro-myelitis optica with atrophy. Clifford Albutt recognized this condition, which is usually myelitis with optic neuritis, in 1870. In 1895 Gault, a pupil of Devic, studied 17 cases, and the disease was given the name of "neuromyelite optique." Since Gault's monograph, Weill and Gellaverdin in 1903, and Brissand and Brecy in 1904 have published observations pertaining to this affection. In most of the cases portrayed by these authors the optic neuritis and myelitis occured simultaneously, but in some the neuritis either antedated or followed the myelitic manifestations. The disease generally ran an acute course and oft-times resulted in recovery. The etiological factor is supposed to be of an infectious nature.

The case reported is that a man, 27 years old, whose illness began with headache, and backache, followed in a short time by impaired vision, terminating three months later in total blindness, the result of neuro-retinitis. Subsequently there was paralysis of the sixth nerve, paralysis of the lower extremities with marked ataxia, and loss of reflexes. At the end of the next three months, under vigorous anti-syphilitic treatment the abducens palsy disappeared; the paralysis of the lower extremities however became more pronounced; rectal and vesical disturbances were now included in the symptom complex. and later meningeal symptoms set in, finally resulting in the patient's death after nine months of illness. No history of syphilis could be elicited.

Autopsy revealed a round cell sarcoma of the liver, meningomyelitis of the lumbar cord. and optic neuritis.

No connection between the sarcoma and the condition of the nervous system could be determined. Weill and Gallaverdin's theory that the disease is characterized by a typical proliferation in the cord of epithelioid cells, was not borne out in this case. According to Huchard, Guinon, Brissand and Brecy these cells are undeveloped endothelial cells of the perivascular spaces. The initial suggested (a) cerebral tumor with myelitis; or (b) gumma of the brain and cord. The subsequent disappearance of the abducens paralysis however contra-indicated cerebral tumor.

The spinal symptoms closely resembled those of luetic meningo-myelitis, but in this case the optic nerve was affected primarily. Cerebral symptoms accompanying a luetic meningomyelitis would presuppose a luetic condition of the cerebral meninges, and if the optic nerve were involved it would be so secondarily. Moreover, anti-syphilitic treatment was practically of no avail.

Kerschensteiner furthermore emphasizes the marked similarity between the symptomatology of chronic neuroymyelitis optica, and pachy- or lepto-meningitis hypertrophica non luetica, especially if in the latter there is present paralysis of one or more cranial nerves.

A. C. S.

Pupillary Inaction as Observed in the Hysterical Paroxysm.

Bumke, (*Muenchener medizinische Wochenschrift,* April 17th, 1906). Bumke limits himself principally to the etiology of this manifestation. While its occurrence has been proven beyond doubt, pupillary inaction is an unusual symptom of hysteria, so rare that for many years it had escaped recognition. Bumke has observed but a single case during the convulsive seizure, and in the interval between paroxysms Uhthoff has yet to see a typical case.

The pupillary disturbance is not identical with the so-called Argyll Robertson pupil, but implies a complete absence of any iris movement. It may be pupillary inaction associated with miosis, or what is more common, with mydriasis. Most writers attribute the condition to either a spasm of the sphincter or dilator muscles of the iris. Where miosis exists, especially if combined with spasm of convergence, Bumke admits the rationality of this view, but fails to see its application in cases of mydriasis, in the intermediate types and in elliptical pupils. He considers the function of the dilator quite subordinate; even electrical stimulation of the sympathetic, or the instillation of cocain into the conjunctival sac will not produce pupillary inaction. In the case of hysteria reported, the convulsive seizure being characterized by unconsciousness, with mydriasis and pupillary inaction, he instilled homatropin and cocain with the following results:

The instillation of homatropin caused no further dilation whereas cocain increased the mydriasis. One eye homatropinized before the seizure resulted in a similar dilatation of the fellow eye during the attack, and if cocain was added to the homatropinized eye, still greater mydriasis followed, conclusively pointing to a disturbance of the innervation of the sphincter centers. Bumke classifies this condition among the psychoreflexes, in which pupillary action and inaction are dependent upon the oculo-motor centers, the reflexes persisting with the occurrence of sympathetic paralysis, and disappearing with paralysis of the sphincter muscle of the iris. In all such cases the sphincter centers are supposed to be under control of cortical centers.

Intermediate and elliptical pupils cannot be explained by any one etiological factor. Miotic pupillary inaction however is usually observed with a spasm of convergence. Wilbrand and Saenger have shown that in marked hysterical sphincter spasm, there was a very slight reaction to light stimulus, which is in accordance with an established physiological principle that maximal convergence will inhibit the light reflex, but not entirely abolish it.

Bumke therefore holds the views that hysterical pupillary inaction whether associated with mydriasis or miosis is intimately related, like all psycho-reflexes, to the ocular-motor system.

A. C. S.

Myopia.

KOENIGSHOEFER, (*Wuerttemberg. medizin. Korrespondenzblatt,* No. 23 Ref. from *Wochenschrift fuer Therapie und Hygiene des Auges,* June 29th, 1905), presents in a concise manner his views upon the development and treatment of myopia. His views are founded upon the findings of Lange in regard to the diminution of the elastic fibres in myopic eyes, as well as upon the relative development of the circular and longitudinal fibres of the ciliary muscle. The latter is influenced by the action of convergence and accommodation.

Myopia is defined as the want of proper relationship between the length of the eyeball and the refraction of its dioptric system, in the sense that the refraction is relatively too strong for the length of the bulbar axis.

The predisposition to acquired myopia lies in diminished resistance of the sclera to the intraocular pressure. The increase in the length of the bulbar axis takes place mostly at the posterior pole. There are four groups of acquired myopia. The first group is the most serious. It contains those cases which from the earliest years are progressive, without apparent outer influences. Ectasia of the sclera sooner or later leads to pathological changes in the chorioid and retina. The three other groups contain those cases which develop with the commencement of near work, or frequently at puberty. Cases of the first group progress only until the far point corresponds with the customary working distance. Under group two, the cases develop mostly at puberty, and progress until developmental changes in the body cease. Cases under group three commence with the commencement of near work, and progress until the end of life, and are especially dangerous at puberty and at the climateric. In eyes predisposed to myopia, the physiological hyperemia from use, does not at once disappear when the work ceases, but probably produces a serous, and perhaps later, an inflammatory infiltration which causes softening of the sclera. At the moment of accommodation there is an increase in the intraocular pressure. The vitreous is practically non-compressible, and the anterior segment of the eyeball is better protected than other portions, so that the pressure exerts its greatest influence at the point of least resistance, viz., the posterior pole. If the circular portion of the ciliary muscle is normal, it controls mostly the changes in the lens during accommodation. If, however, it is deficient, (Lange) greater work devolves upon the longitudinal fibres of the ciliary muscle; the chorioid is drawn forward, and the vitreous is pressed with greater force backward. A sclera rich in elastic fibres, can withstand this pressure without injury; one poor in elastic fibres, however, yields and becomes ectasic. Predisposition is necessary to the development of myopia; a defective circular muscle is not necessary, but of unfavorable moment.

During convergence, the external recti are passive, and exert a pressure upon the anterior portion of the eyeball. When the eyes are turned downward, the inferior recti and superior oblique are active, and the superior recti and inferior obliques are passive. The latter exert a pressure upon the eyeball. By the combination of convergence and infraduction, the contents of the eyeball are pushed backwards. These factors continued for a long time to produce in the predisposed eye a lengthening of its sagittal axis. When myopia is developed, a lessened degree of accommodation is required for near work, and at first with this diminution in accommodation impulse, comes a diminution in convergence impulse, which would cause the visual axes to cross behind the object looked at. The result would, of course, be indistinct vision. To correct this, greater convergence impulse is required, followed by increased accommodation effort, resulting likewise in indistinct vision. Want of harmony between convergence and accommodation is, therefore, at once apparent. An increased tonus in the ciliary muscle is produced, by which complete relaxation does not follow cessation of near work; or, finally, spasm of accommodation may develop.

Insufficiency of the internal recti will follow if these muscles do not respond to the increased amount of labor put upon them.

Regarding the treatment, the author says that acquired myopia develops originally from hypermetropia or emmetropia, therefore we should substitute the myopic eye by the emmetropic eye artificially produced by full correction, and places it in the same condition as before the myopia started.

Before a full correction should be ordered, the following points must be determined: (1) If the myopia in each eye is of the same grade; (2) if the monocular and binocular ranges of accommodation are normal; (3) if the objective and subjective myopia correspond; (4) the power of convergence (high grade myopia). If there is no hyperemia of the disk, and no beginning of staphyloma, myopia of 1.5 to 2 D. is given full correction, but a working distance of 30 to 40 cm. is required.

Myopia of 2 to 6 D. is given full correction for distance, and for near work the far point is put at 60 to 70 cm., so that accommodation is not entirely dispensed with.

If there are hyperemia, and staphyloma formation, there is in all probability a strong predisposition. Full correction is given for distance, but for near work accommodation and convergence are so far as possible eliminated. When monocular myopia is greater than binocular myopia, and the objective findings are less than the functional tests, the accommodation is to be regarded as of greater import than the convergence. Ciliary tonus is then suspected, and prolonged atropinization is indicated. Such cases should be so treated for two or three weeks, and the treatment should be repeated at subsequent examinations. W. Γ. S.

Stovain as a Local Anesthetic.

WOSKRESENSKI. (*Fortschritte des Medizin.*, 1905, No. 18. Ref. from *Wochenschrift fuer Therapie und Hygienc des Auges,* July 27th, 1905.) Stovain was used by the author in the form of a ½, ¾, and 1 per cent. solution injected. A complete local anesthesia was secured in 30 cases, from which the following conclusions are drawn:

1. In no case was there intoxication, the pulse, respiration, pupillary reaction and central nervous system not being appreciably affected.

2. Anesthesia appears almost immediately after injection.

3. Anesthesia lasts about 20 minutes.

4. The anesthesia remains limited to the area infiltrated with the stovain.

5. Although a vasodilator, hemorrhage is not more marked than usual.

6. Hyperesthesia does not follow the anesthesia, as is frequently the case with cocain.

7. Solutions of ½ and ¾ per cent. are equal in their effects to 1 per cent. solution of cocain.

Myasthenic Paralysis: (Bulbar Paralysis Without Anatomical Findings.)

BRUNS, L., (Ref. from *Wochenschrift fuer Therapie und Hygiene des Auges,* August 17th, 1905.) The ocular symptoms are unilateral or bilateral ptosis, typically transient and of unequal degree. Not infrequently there is complete ophthalmoplegia externa. The intraocular muscles are never involved. The upper branch of the facial is sometimes affected, resulting in varying degrees of lagophthalmos. The disease is most often mistaken for hysteria. W. T. S.

Alypin, a New Anesthetic.

SICHERER, (*Die Ophthalmologische Klinik,* August 20th, 1905). Alypin is the monochlorhydrate of benzol, and is freely soluble in water. Boiling for 10 minutes sterilizes without destroying its anesthetic properties. It can be used with adrenalin without undergoing chemical or pharmaceutical change. Solutions of 2 to 4 per cent. can be used upon mucous membranes, or subcutaneously without danger or disagreeable symptoms. The effect upon the blood vessels is to cause dilatation, the opposite of cocain, which is vaso-constrictor.

Anesthesia of the cornea is complete 60 to 70 seconds after instillation of a 2 per cent. solution, and lasts 10 to 12 minutes and often longer. No effect is produced upon the pupil or upon accommodation, nor is the corneal epithelium disturbed as it is by cocain. It has the following advantages over cocain:

1. It is less poisonous.
2. It produces no mydriasis or paralysis of accommodation.
3. It does not injure the cornea.
4. It is much cheaper. W. T. S.

Blepharospasm Caused by the Eruption of a Tooth.

DECOOPMAN, (*Die Ophthalmologische Klinik,* October 20th, 1905). This patient, a three-year-old child, suddenly developed blepharospasm, which resisted all attempts at relaxation. No cause could be found in the skin of the head, the nose, throat, ear or eye; there was no glandular enlargement; the general nutrition was excellent; there was no pain, but swelling of the gum over the first permanent molar was noted. Free incision was made, after which the lid spasm disappeared.

The author calls attention to the inosculation between the terminal filaments of the infraorbital branch of the trigeminus, and the temporal branches of the facial nerve, and believes that no mention has hitherto been made of blepharospasm in relation to the physiological eruption of the teeth. W. T. S.

A Simple Method of Operating Upon Certain Forms of Chalazia.

ANTONELLI, (*Die Ophthalmologische Klinik,* October 20th, 1905). For chalazia situated near the lid margin, Antonelli recommends passing a double-edged lance through the lid margin, just back of the cilia, and in the line of Meibomian ducts, into the cyst. This method he considers better than the usual one of entering through the conjunctiva or skin of the lid, according to the tendency which the chalazion has to open spontaneously in one or the other direction. The only contraindication to this method is a chalazion situated in the upper lid far from the lid margin. W. T. S.

Dacryocystitis Following Operation for Empyema of the Antrum.

JOCQS, (*Die Ophthalmologische Klinik,* November 5th, 1905). The patient was a 52-year-old woman who had had chronic empyema of the antrum of 6 years' duration. The sinus was opened through the canine fossa. Dacryocystitis with obstruction developed 4 days after operation, in a previously normal sac and canal. Two similar cases are reported in French literature (Leblond).

Two explanations are possible. First, an ascending infection from the maxillary sinus through its communication with the nose, and second, closure of the nasal opening of the lacrimonasal canal, which is, in the majority of cases, injured in the Caldwell-Luc operation. Leblond favors the theory of ascending infection, but Jocqs regards as far more likely the theory of traumatic obstruction of the lower portion of the canal. W. T. S.

Sympathectomy in Glaucoma.

ABADIE, (*Die Ophthalmologische Klinik,* December 5th, 1905), first practiced this operation in 1897 upon cases of glaucoma that could not be controlled, either by iridectomy, or by the use of miotics. Sympathectomy is not indicated in cases in which iridectomy results favorably, nor in cases of chronic glaucoma simplex, in which the vision can be almost indefinitely preserved by the instillation of miotics, but should be restricted to a certain line of cases which seem to be hopeless in spite of iridectomy and miotics. The author reports three such cases upon which he performed sympathectomy, after all other means had failed and procured thereby good and permanent results. W. T. S.

The Use of Doyen's Antistaphylococcus Serum in Dacryocystitis.

DARIER, (*Die Ophthalmologische Klinik,* December 20th, 1905), has tried hypodermic injections of this serum in three cases of chronic dacryocystitis. Two cases were promptly cured, and one case failed to respond, although he thinks sufficient time was not allowed. The quantity of serum injected at one time was 2½ to 5 cc. The injections were followed by great pain, and in one case by fever. In the first case six injections in all were tried, at first every day, then every third day; a perfect cure resulted. In the second case which was successful, only three injections were made. In the third case no pus remained in the sac after three injections.

W. T. S.

Thrombosis of the Central Retinal Vein.

HARMS, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905), reports the anatomical findings in four cases of complete obstruction of the central retinal vein. Clinically, two of the cases presented the picture of hemorrhagic retinitis, and ended in glaucoma, and two were at the time of thrombosis already cases of hemorrhagic glaucoma.

Four anatomical possibilities for the etiology of the condition were represented. The first case was one of marasmic thrombosis; the second showed a thrombosis beyond a constriction in the vein, and in a lumen of nearly normal diameter; the third case was due to a primary meso- and endophlebitis, and the fourth case was consequent upon a previously existing endophlebitis.

But three anatomical examinations had been made in cases of spontaneous thrombosis of the retinal veins up to 1899, the first one being by von Michel in 1878. For a long time the condition was looked upon as being dependent upon some general vascular process. It is a well known fact, however, that spontaneous thrombosis of the retinal veins occurs in persons otherwise healthy, and in whom careful examination of the blood gives only negative results, and that the underlying cause may be localized in the blood vessel wall, as a proliferating endophlebitis. W. T. S.

Corneal Ulceration Due to the Diplobacillus.

PAUL, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905). Corneal complications are relatively rare in diplobacillus conjunctivitis, considering the frequency and severity of this form of conjunctivitis. When present the cornea is usually the seat of a simple uncomplicated ulcer, which disappears with or without treatment, leaving but little opacity. In a few cases there may be a severe hypopyon keratitis, in which bacteriological examination will show the presence of the Morax-Axenfeld diplobacillus only. Petit, in particular, described three cases of severe hypopyon keratitis in which he was able to demonstrate as the cause the Morax-Axenfeld diplobacillus. The so-called Petit diplobacillus, however, can be differentiated from that of Morax-Axenfeld, so that there is doubt as to the identity of the two processes.

It is important, from the standpoint of treatment, to make a differential diagnosis between the corneal ulceration due to the diplobacillus, and that due to the pneumococcus, or the ordinary ulcus serpens. The clinical characteristics of the typical serpiginous ulcer are the pus-covered floor of the ulcer, hypopyon, iritis, chemosis, and severe subjective symptoms, especially pain and photophobia. The differential diagnosis can, however, in many cases be made with certainty by bacteriological examination.

Paul had studied 25 cases of diplobacillus ulceration, and gives his results in full tabulation.

He concludes that the Petit diplobacillus can produce exactly the same conjunctival process as that of Morax-Axenfeld, and that severe corneal complications which have hitherto been thought to be produced only by the Petit diplobacillus, can also be produced by the Morax-Axenfeld bacillus.

He believes that in all probability these organisms are identical, and that Petit's diplobacillus is but a special kind or variety of the Morax-Axenfeld diplobacillus. He calls attention to the fact that there are at least 30 recognized varieties of the pneumococcus, and, also several varieties of the tubercle bacillus, as well as red and white colonies of the bacillus prodigiosus which, in spite of these and other differences, are considered identical.

Paul's final conclusions are:

1. Not only the Petit diplobacillus, but also the Morax-Axenfeld can at times produce severe suppurative processes in the cornea.
2. The clinical picture of such cases bears but little resemblance to that of typical serpiginous ulcer.
3. The prognosis is much more favorable than in ulcus serpens.
4. The ulceration follows usually upon injury to the cornea.
5. Lacrimal disturbance is as a rule absent, but there is generally a characteristic diplobacillus catarrh of the conjunctiva.
6. In most cases, treatment without cauterization of the cornea is sufficient. The best local application is zinc in combination with mild aseptics. W. T. S.

The Anatomy of the Lacrimal Sac With Special Reference to the Lacrimal Sac Glands.

Werncke, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905). Four years ago, Werncke examined 17 lacrimal sacs extirpated from cases of dacryocystitis, with a view of determining why dacryocystitis so frequently was secondary to trachoma, and infections in the surrounding tissues. For comparison, normal sacs were examined, and in the latter glands were found, which were not present in a single one of the pathological cases. In a certain number of the pathological cases pseudo-glands were found, *i. e.*, thickening and ingrowth of the epithelium. The majority of observers recognized the presence of glands in the lacrimal sac, a view which is, however, combated by quite a number.

Werncke's recent investigations comprise an examination of 14 lacrimal sacs removed post mortem, and all of them practically normal. In 8 cases true glands could be demonstrated; in the remaining 6 cases more or less catarrhal change was found, and in 2 of them these changes were quite extensive. Of the 8 sacs containing glands, one gland was found in 4, three in 2, and six in 1. The glands were of the compound tubular variety, and mostly from 0.3 to 1.5 mm. in diameter. They are situated generally in the anterior and nasal walls of the sac, and in most cases up near the fundus.

Special attention is called to the fact that these glands were found only in normal, or nearly normal, sacs. The presence of the pseudo-glands in the pathological sacs is more easily explained than the absence of the true glands.

Long standing catarrh and folding of the mucous membrane must lead to changes in the epithelium. The latter becomes degenerated and mucoid, and by ingrowth can form the pseudo-glands. For the absence of the true glands in the pathological cases, the author accepts the explanation of Jocqs, viz.: that they are destroyed by long standing dacryocystitis, just as the conjunctival glands are destroyed by trachoma, the chief factor being inactivity due to obstruction.

Werncke's findings, he expresses as follows:

1. Follicles were found but three times, and in sacs showing catarrhal changes. In normal sacs, they are exceedingly rare. They are regarded as pathological, and are generally, but not exclusively the result of trachoma of the sac.

2. Ciliated epithelium, Werncke has never found in the sac.

3. The epithelium of the lacrimal sac was always arranged in two or three layers.

4. The sinus Maieri was found twice.

5. A fold of mucous membrane at the entrance of the canaliculi, which Werncke considered artificially produced, was found once. Unless this be an example of the plica of Rosenmuller, such was not found.

6. The recess of Arlt was not found constantly.

7. Reduplications of the lacrimal sac (Monesi) or multiple sacs were not found. In cases which were apparently of this kind, serial sections showed the condition, due to a vertical fold.

8. The glands found in the lacrimal sac were:
    (*a*) Compound tubular glands, .5 to 1.5 mm. in diameter. These are sharply circumscribed, and have their ducts close together.

(*b*) Small compound tubular glands from 200 to 300 micromes in diameter, having their very small outlets widely distributed, and not forming a compact unit.
(*c*) Simple tubular glands, non-pathological.
(*d*) Pseudo-glands resulting from pathological changes.

W. T. S.

A Case of Metastatic Suppurative Tenonitis.

Jocqs, A., (*Die Ophthalmologische Klinik,* October 20th, 1905), reports a case of suppurative tenonitis in a male patient 73 years old, suffering from the effects of an enlarged prostate and retention of urine. The eye was also the seat of a chronic iridochorioiditis, in the stage of an acute exacerbation, as shown by hypopyon and ciliary injection.

The author calls attention to the following points: chronic iridochorioiditis is very seldom found in men, but is frequently seen in women at the time of menopause, from which latter fact is drawn a relationship between the uterus and ovaries on the one hand, and iridochorioiditis on the other. Jocqs regards the iridochorioiditis in these cases, not as an infectious process, but as an intoxication-toxemia, due to retained products of tissue change.

Eye diseases due to auto-intoxication are, as a rule, double-sided, while an infectious metastasis would usually affect but one eye.

The previous attacks of uveitis, as well as the attack of tenonitis in the author's case, are regarded by him as an example of infectious metastasis, in the presence of long standing disease of the urinary tract.

Comparison is made with three cases of suppurative tenonitis reported by von Pruech, Rollet and Le Roux. In these three cases the beginning symptoms were those of iridochorioiditis. Characteristic of these three cases, and of the author's case, is the absence of pain, which differentiates them from the tenonitis of rheumatic origin, which is very painful. This point Jocqs regards as important in the differential diagnosis between secondary (metastatic) and primary tenonitis.

The abscess in suppurative tenonitis breaks over the insertion of the rectus muscle, and the condition subsides rapidly after the discharge of pus. The prognosis is good, but the accompanying iridochorioiditis can cause irreparable damage.

Exophthalmos, with chemosis and lid edema, without pain, occurring in the course of an infectious disease, must always give rise to the suspicion of suppurative tenonitis.

W. T. S.

Combined Transverse Keratotomy.

CHEVALLEREAU, (*Die Ophthalmologische Klinik,* October 20th, 1905). The object of this operation is to procure a good stump for an artificial eye, in those cases in which there is no chance for vision and no danger of sympathetic trouble. The healing process is relatively long, 6 weeks being the shortest time in which a prothesis can be worn. The technique is simple.

Under general anesthesia, with lid speculum in place, the horizontal meridian of the cornea is cut completely through from limbus to limbus. The iris is seized with forceps, and by a circular drawing movement torn from its ciliary attachment. The lens capsule is cut with a cystotome, and the lens removed with a spoon. The speculum is at once removed, and a sufficiently retaining bandage is quickly applied. In the following days the cornea gradually becomes smaller, until it is nothing but a point. By exenteration bulbi, the shrinking is much greater, and in many cases the end result is no better than enucleation.

In cases of total adherent leucoma, as much of the iris is torn away as can be caught by the forceps. The operation is most difficult in cases of congenital hydrophthalmos. The tension is, as a rule, raised, and the cornea very thin; hemorrhage is free, obscuring the field of operation. The operations of Panas and Critchett are applicable to the same cases, as is the operation under consideration. Stitches are used in these operations, however, and passing as they do through or near the ciliary region, they are open to the objection of possible sympathetic trouble as a subsequent complication. Chevallereau has performed transverse keratotomy 28 times for the following conditions: congenital buphthalmos, 1; acquired buphthalmos, 10; total staphyloma, 11; total leucoma, 5; and glaucoma, 1. The ages of the patients ranged from 14 months to 65 years. W. T. S.

Intermittent Lacrimation Caused by the Esophago-Lacrimal Reflex, in a Case of Facial Paralysis.

MICAS, (*Die Ophthalmologische Klinik,* October 20th, 1905). The case reported is that of a 20-year-old man who suffered from a characteristic lacrimation, which followed an attack of facial paralysis one year before. The facial paralysis was rapidly cured. The lacrimation occurred when eating, and especially when drinking water and tea. The facial paralysis was of the ordinary type, following exposure to wind at sea. The eye symptoms were widening of the palpebral fissure, lagophthalmos, and drooping of the lower lid. All the acts of eating, swallowing, etc., were attended by profuse lacrimation.

At the time of examination, one year after paralysis, both eyes were normal; upon the affected side lid closure was complete, but there was slight eversion of the lower lid. During cold weather there was practically no increased lacrimation, but at mealtimes the patient was much disturbed by a copious flow of tears. Slitting of the canaliculus gave good results, and limited the lacrimation to the end of the meal only.

These cases are exceedingly rare. Lacrimation after facial paralysis, especially while the lower lid is still everted, is of no consequence, but the exacerbations caused by eating are of especial interest. The explanation of the phenomenon, Micas believes lies in the esophago-lacrimal reflex described by Carnot.

Carnot says: "Frequently, and not only in sensitive individuals, the passing of an esophageal sound causes a copious flow of tears. The reflex secretion of the tears does not seem to be caused by pain or irritation. It commences and ends with the increase of the salivary secretion, and is likewise increased by irritation of the salivary ducts. Occasionally there is also nasal secretion. Although I have made no physiological experiments, I believe that the mechanism of this reflex is the same as that of the salivary reflex. The reflex arc is the pneumogastric nerve."

The symptoms in the reported cases are in all probability due to this reflex. The reflex is liberated by the passage of food, and the repeated passage of food acts like the irritation of the salivary ducts; for this reason the lacrimation appears toward the end of the meal. It is curious that the lacrimation is unusually severe when the patient eats soft food, oysters, etc.

Micas does not believe that the facial paralysis was the cause of, or produced the Carnot reflex, but, rather, that so long as the lacrimal apparatus was intact, the increased flow of tears was well disposed of. After the facial paralysis, however, the weakened Horner's muscle, disturbed the equilibrium, and the patient noticed the excess of tears when eating.

W. T. S.

Enucleation Under Combined Local Anesthesia.

MEYER, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905). By combined local anesthesia, Meyer means the use of cocain upon the surface, during the separation of the conjunctiva and muscle attachments, and the injection of Schleich fluid No. 2—(cocain muriat, 1; morph. muriat, .025; sodium chlorid, .2; and aqua dest., 100.) for the deeper and final stages of the operation. It is a combination of the direct application of cocain, and infiltration anesthesia. In inflammatory cases, the addition of adrenalin acts advantageously. In the last year he has enucleated 80 eyes under this method of anesthesia. Cocain is used in solution of 1 to 2 per cent., and for the infiltration of the deeper structures, about ½ Anel's syringe full of the above fluid is introduced through a curved canula, after removing the speculum and pressing upon the lids to prevent regurgitation. Of these 80 cases, 46 experienced no pain at all; 24 complained of pain which was not, however, unbearable, and 10 complained of pain too severe to be borne. The latter were, without exception, cases of chronic glaucoma and severe cyclitis, and persons who had become, on account of the long continued disease, unduly sensitive.

The 46 cases in the first group had mostly non-inflammatory eyes.

The part of the operation causing the most pain in 30 of the cases was the cutting of the muscle tendons, and the separation of adhesions. Section of the optic and the ciliary nerves caused painful reaction in only 4 cases, due, the author believes, to unskillful infiltration of the tissues.

W. T. S.

Amyloid Degeneration of the Lids and Conjunctiva.

RAEHLMANN, (*Die Ophthalmologische Klinik,* September 15th, 1905.) Physiologically, amyloid material belongs to the albuminoids, but chemically it is classed with the carbohydrates, similar to glycogen, which normally represents in the body an intermediate product between albumin and sugar. Amyloid degeneration, as is well known, follows frequently upon colloid and mucous metamorphosis. It may be histologically demonstrated by iodin, iodin and sulphuric acid, methyl-violet, etc., and by the double staining of Van Gieson, and of eosin and hematoxylin. The changes which take place in the albuminous products of the normal tissues are under the influence of fermentation substances which enter.

Raehlmann, from his investigations with the ultra-microscope, found that the entering albuminous ferments were not in the body tissue fluids in solution, but as formed bodies in suspension. In conjunction with the already present albumins, or their products, these entering ferments form new albuminous bodies with other molecular composition, and chemical pecularities (reactions). Raehlmann, with the ultra-microscope, has been able to directly observe the change from tissue albumin to albuminose or peptone, after the addition of a ferment, and also the change from glycogen to sugar.

The underlying structure of glycogen which is closely akin to amyloid material, is seen to consist of small, distinctly visible spherical gray bodies, which upon the addition of diastase, become smaller, break up, and gradually disappear. So long as the solution contains these little round bodies, it is characterized as glycogen; when, however, they have disappeared, the solution is sugar.

A priori, it might be presumed, that amyloid material which is chemically similar is derived from albumin, by processes likewise similar. The introduction, therefore, of an albumen molecule acting as a ferment would cause, then, a change of the local tissue albumin into amyloid structure. Raehlmann finds this view supported by a number of microscopic findings, among which is the fact that in the beginning of amyloid degeneration, before the characteristic reactions are found, there is observed in the affected tissue a deposit varying from fine, dust-like to granular in character. When the degeneration begins in the cellular tissue immediately under the conjunctival epithelium, the cells become at times granular, which must be considered as a transformation of the cell albumin, and the introduced material which has caused the albumin change. These granules are frequently found within the nuclei of the affected cells, preferably limited to them, and the nuclei contain numbers of larger and smaller granules. Raehlmann demonstrated, by chemical reaction, that this granule formation was the beginning of amyloid degeneration. This granular formation is also seen in the early stage of hyalin and colloid degeneration. Almost identical granules have recently been described by Traine and Ziegler as constant phenomena in the drusen cells of different organs, as fat particles. As clinical experience teaches that in amyloid degeneration localized in the eye, a cure can be effected, and the tissue brought back to its original condition, Raehlmann offers in explanation, that during the stage of degeneration, the original tissue composition, has, chemically, at least, remained intact.

W. T. S.

A Case of Complete Traumatic Detachment of the Retina From the Optic Nerve.

PAUL, (*Klinische Monatsblaetter fuer Augenheilkunde,* February, 1905). The author's case is the tenth one of the kind in literature, differing, however, from the others in that the optic nerve was not torn partially, or totally, from its bulbar attachment, and that for a number of days the media remained clear, permitting of perfect ophthalmoscopic observation.

The patient was a boy of 14 years old. The eye was struck against the rather broad, blunt end of a post. Unconsciousness followed for a time, but there was no evidence of fracture of the skull. The eye was, from the time of accident, entirely blind. Movements were good, the pupil was half dilated, inactive to direct stimulus, but with consensual reaction. The lens was clear and in place; there were several hemorrhages in the bottom of the vitreous, which was otherwise clear.

The papilla could not be seen. In its place was a large hemorrhage. Surrounding the papillary area was a well illuminated zone, red in color, like the normal eye-ground. This zone was 3 to 4 p. d. in diameter, and within it no vessels were visible. The outer margin was sharply defined against the dirty, gray-white retina, by a zig-zag line. The macula showed the cherry red spot. All retinal vessels were reduced, but in a measure contained blood. The ocular tension was reduced; refraction was emmetropic. W. T. S.

A Case of Chorioidal and Retinal Detachment Associated With Cyclic Albuminuria.

SIMON, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905), reports this condition in an 18-year-old female, and considers the cyclic albuminuria a potent factor in the etiology, or that both the albuminuria and the ocular affections are due to the same underlying cause. The eye affections in cyclic albuminuria were discussed by Aswalt in 1897. In Simon's case the detachment was a large one, which was fixed, and showed none of the floating movements characteristic of simple retinal detachment. Fuchs differentiates four varieties of chorioidal detachment, none of which corresponds to the author's case. In the latter, the introduction of aqueous humor beneath the chorioid, and hemorrhage from the chorioidal vessels are excluded. A diseased vitreous is also excluded, as this structure was perfectly clear and of normal consistence.

Finally, inflammatory exudate would occur only in the presence of severe chorioiditis or scleritis, and is not to be considered in this case. The most probable cause Simon believes to be an albuminous transudation separating the chorioid from the sclera, and in one spot the retina from the chorioid.

W. T. S.

Bitemporal Hemianopsia and Diabetes Insipidus.

REDSLOB, (*Klinische Monatsblaetter fuer Augenheilkunde*, February, 1905). A number of cases are found in literature in which temporal hemianopsia is associated with diabetes insipidus. These cases can be divided into two categories, viz.: those in which the two symptoms appear in conjunction with neoplasms of the brain, and those of traumatic origin. The most frequent tumors so associated are carcinomata and syphilitic growths of the brain; the traumatic cases are almost always basal fractures.

The case reported is that of a 14-year-old girl, who, two months before observation, sustained a fracture of the base of the skull. Diabetes insipidus and deterioration of vision followed shortly after the accident. The eyes were externally normal; there was some difference in the reaction of the pupils to direct light; hemianopic pupillary inaction was uncertain;

the media were perfectly clear; both nerve heads were white, especially in the temporal quadrants; the vessels were normal; there were no hemorrhages. The visual fields showed bitemporal total hemianopsia, with the dividing line perfectly straight in the vertical meridian, and the macula included in the seeing fields.

The relative frequency with which diabetes insipidus and bitemporal hemianopsia are associated has been looked upon by some authors as an indication of a direct relationship between these two affections, some even asserting that the diabetes insipidus is the cause of visual disturbance. But bitemporal hemianopsia can only be produced by a lesion of the chiasm affecting the crossed fibres, the uncrossed remaining unnjured, while diabetes insipidus is caused by a lesion in the floor of the fourth ventricle (Claude Bernard).

Bitemporal hemianopsia and polyuria are frequently found together in akromegaly. In this disease there is often a tumor of the hypophysis, which can well cause the hemianopsia, and which might be thought to also cause the polyuria, but Sternberg has found that the increase of urinary secretion in akromegaly is but the natural result of polyphagia and polydipsia, which are characteristic of this disease.

Redslob concludes that the presence of diabetes insipidus and bitemporal hemianopsia in this and similar cases is only the accidental appearance of the two symptoms, due, of course, to the same cause, but in no way dependent one upon the other. W. T. S.

The Operative Treatment of Lamellar Cataract.

ASK, (*Klinische Monatsblaetter fuer Augenheilkunde,* April, 1905). The operations for lamellar cataract naturally fall into two categories: Those upon the iris (iridectomy), and in exceptional cases iridotomy, and those upon the lens, extraction or discission, as the case might be. Both forms of operation have their special indications, but in the text-books and in the journal literature of the past year opinions differ as to when to follow the one or the other procedure.

When the opacity is extensive, and vision is improved by mydriasis, and the stenopaic slit, Vossius advises a small iridectomy with converging pillars. Regarding the lens operation, especially discission, the same author is more cautious. He says: "Discission may be performed, and several times repeated, when the pupil is dilatable at maximum. If the pupil can only be half dilated, long continued inflammation of the iris is apt to follow with disastrous results. In most cases, after discission, many months elapse before a useful eye is obtained."

Fuchs and von Michel favor mostly discission, but advise iridectomy when the vision can be markedly improved by mydriasis, and the stenopaic slit, and when the opacities are thought to be stationary. Other authors advise only the lens operations. Silex, for example, performs discission of the young lens, and extraction in adults after artificial ripening. He regards iridectomy as being of little optical use, and as causing, in many cases, irreparable harm, on account of diffraction and the abberations produced by it.

Critchett is an advocate of iridectomy in suitable cases, with sharply defined limited opacities, clear lens periphery and good vision. He lays stress upon the position of the wound, which should be down and in, and not carried to the periphery. Just sufficient iris should be removed to meet the indications, and a narrow strip at the periphery should be left undisturbed. Nettleship remarks that this operation is only applicable in exceptional cases.

Baehr rejects iridectomy, and sees in lens removal the only operative procedure for zonular cataract. He is in accord with the view previously expressed by Hirschberg, that even after iridectomy, the remaining lens opacities, on account of the diffusion of light, render sharp retinal images impossible. The myopia, which in most cases already exists, is apt to increase, and may become of high grade. Hansen Grut has recently declared that iridectomy in lamellar cataract should be discarded.

Prof. Schoeler, from whose klinik the author has prepared his data, performs iridectomy in these cases, when by the usual artificial means of correction, the vision for distance and near can be measurably improved. Since 1897 the iris operation has been performed in his klinik in 46 cases, and Ask is able to show conclusively that useful vision can, in many of these cases, be obtained by the iris operation.

Seven selected cases, including both forms of operation, are critically reviewed and the pros and cons of each discussed.

W. T. S.

Metastatic Chorioidal Carcinoma.

GELPKE, (*Klinische Monatsblaetter fuer Augenheilkunde*, April, 1905), reports in detail a case of medullary carcinoma, or alveolar carcinoma (Woelfler) of the thyroid gland, giving rapid metastasis to the long bronchial glands and chorioid. Comparison showed great similarity in the structure of the thyroid and chorioidal tumors, so that the latter he classifies as a medullary metastatic carcinoma. The case is essentially as follows: A 51-year-old female, who, during the first 20 years of life was strumous; between 20 and 30 the struma increased, after which it remained stationary. At the beginning of the menopause, carcinomatous degeneration commenced in the thyroid gland, with rapid metastasis to the lung and to the left eye. The eye was enucleated in status glaucomatosus. Six weeks later the patient died without involvement of the right eye.

The author's case differs from other cases of carcinomatosus, principally in the seat of the primary tumor, which is in the vast majority of cases the breast. Thus, among 43 cases the primary growth was located as follows:

In 29	68 per cent. breast.
In 5	12 per cent. lung.
In 3	7 per cent. stomach.
In 2	4 per cent. liver.

It was found once each in the trachea, suprarenal glands, thyroid gland, and intestine.

The author's case is, therefore, the second in literature in which the thyroid gland was primarily affected. Females show a much greater predisposition than males; in 48 collected cases 34 were females and 14 were males.

That the eye is seldom affected in metastatic carcinoma is shown by Ehrhardt's statistics. In 166 cases of "malignant struma" he found:

Metastasis in the bones	66 times.
Metastasis in the lung	43 times.
Metastasis in the liver	21 times.
Metastasis in the kidney	13 times.
Metastasis in the pleura	10 times.
Metastasis in the brain	7 times.
Metastasis in the suprarenals and omentum	2 times.
Metastasis in the omentum and intestine	1 time.

In not a single case was metastasis found in the eye.

Gelpke believes from his pathological findings that had his case survived for a longer time, the other eye would have been attacked, and in a way not recognized as the usual, viz., through the sheath of the optic nerve. He found in the nerve directly back of the lamina cribrosa, and in the angle of the nerve sheath, numerous cancer cells, which he thinks, without doubt, were gradually wandering backward and down in the other nerve.

W. T. S.

A Case of Gumma of the Optic Nerve Back of the Papilla, and Gummatous Chorioiditis.

STOCK, (*Klinische Monatsblaetter fuer Augenheilkunde*, May, 1905), reports this rare condition in a female patient 58 years old. Gummatous tumors of the iris and ciliary body are relatively frequent, but situated in the posterior portion of the eyeball, they are but very infrequently found.

The enucleated eyeball showed macroscopically great thickening of the optic nerve, which was double the normal diameter.

Microscopically, the cornea, in all its layers, was intact. The anterior chamber was of normal depth; the aqueous was apparently rich in albumin; a few leucocytes were distributed throughout, and quite a collection was found in the floor of the chamber. Fresh blood corpuscles were found upon the surface of the iris. The iris was thickened and infiltrated with round cells. The pupillary margin was adherent to the lens capsule. The ciliary body contained an abnormal number of cells, but was otherwise normal.

Beneath the retina below was a fibrinous exudate; the ganglion cell layer was mostly destroyed. The chorioid peripherally was somewhat thickened from edema and round cell infiltration; the vessels were dilated and filled with blood.

The nerve sheaths were greatly thickened, and infiltrated; the vaginal spaces were obliterated. The nerve itself, 4 mm., back of the lamina cribrosa, was 4 mm. in diameter, and nodular. Within the nodulated portion of the nerve there were no nerve fibres demonstrable. The node consisted mostly of detritus. Between the chorioid and retina near the papilla was a layer of exudate 1 mm. in thickness. In the places the chorioid was completely destroyed.

This case presents pathologico-anatomically two isolated foci of invasion, the optic nerve and the chorioid. Necrotic processes of this kind are found in either tuberculosis or syphilis. The absence of giant cells and general tubercular structure fixes the diagnosis of the author's case as syphilis.

Very few anatomical examinations have been made upon cases of gumma, in which the head of the optic nerve was involved, although Uhthoff has shown that gummatous processes in the posterior portion of the optic nerve, the chiasm and the optic tracts are not so infrequent. W. T. S.

A Benign Stationary Tumor of the Fundus.

MAUCH, (*Klinische Monatsblaetter fuer Augenheilkunde*, May, 1905), describes a conical tumor with triangular base situated in the retina and chorioid, which he had under observation for seven years, and which has not undergone any deleterious change. He is unable to find such a case in literature back as far as 1870. There was a connective tissue strand upon the otherwise normal papilla, projecting into the vitreous. At the macula there was an intensely black spot, about one-half the size of the disk. The tumor is situated in the temporal fundus, commencing 3 p. d. from the disk margin, and a little below the horizontal meridian. The summit of the cone is measured by + 10 D., the margin of the disk by — 1.5 D. The neoplasm has an actual height at the centre of 4 to 5 mm.; at the base it measures about 12 mm. in breadth, and 2½ mm. in thickness. The retinal vessels pass directly over the growth. The nasal field was much cut, and there was a relative scotoma between the disk and macula. The author believes the process to be a chronic one of benign nature.

What kind of a growth it is, why it has taken such a peculiar conical form, to which structure it primarily belongs, and the relationship of the various clinical phenomena, are questions which must, he says, remain unanswered.

W. T. S.

Iridocyclitis Complicating Whooping Cough.

CHRONIS, (*Klinische Monatsblaetter fuer Augenheilkunde,* May, 1905). In the case reported, a child nine months old, the eye became inflamed two weeks after the commencement of the cough. There was a marked mixed injection of the eyeball; cornea hazy; anterior chamber obliterated; posterior synechia; pupil small, and filled with exudate; tension reduced. Diagnosis, iridocyclitis. The eye subsequently became blind.

In considering the cause of the iridocyclitis, two factors present themselves; congenital syphilis and pertussis. There were no evidences of the former, so the author accepts the latter as the cause. The method of infection he thinks most probably was by capillary embolism.

Iridocyclitis has been noted in a number of infectious and other general diseases, viz.: recurrent fever, typhoid, cerebrospinal meningitis, syphilis, tuberculosis, rheumatism, influenza, etc. Ocular involvement has also been noted in whooping cough, but not so often. Knapp observed ischemia of the retina in a 3-year-old pertussis boy. Landesberg reported 4 cases of eye disease in whooping cough:

(1) Cloudy media and swelling of the disk; (2) exophthalmos; (3) intraocular hemorrhage, and (4) luxation of the lens.

Brain hemorrhage with corresponding local symptoms, for example, hemianopsia, has also been observed (Silex). Also, cerebral symptoms, visual disturbance, paralyses, etc., not due to hemorrhage, have complicated the disease.

Finally, cases of sudden bilateral blindness, with pupillary reaction intact, normal fundus, and without albuminuria, come within the category.

Chronis has not found in literature. however, a single case of iridocyclitis occurring during whooping cough.

W. T. S.

Cataract Extraction and Cataract Ripening.

BAEHR, (*Muenchener Medizinische Wochenschrift,* February 14th, 1905), calls attention to the few really radical changes that have been made since Daviel and von Graefe performed their early cataract extractions, the more satisfactory results achieved at the present day being chiefly due to the introduction of cocain and antisepsis. The von Graefe modified linear extraction with iridectomy was at first practiced by most operators the world over. Modifications by Arlt, Becker and Horner, who did not favor the peripheric corneal section were made, and Schweigger, a pupil of von Graefe, returned to the old Daviel operation without iridectomy. While the von Graefe operation was popular with most German operators, the Schweigger method found a foothold in France.

In uncomplicated cases, Baehr performs simple extraction, only performing an iridectomy, and that a very small one, when he thinks it absolutely necessary, as in unripe cataracts, in cataractous lenses containing large nuclei, and in complicated cataracts.

In unripe, and slowly ripening cataracts, and in those of whose structure he is in doubt, he advises his ripening process. The procedure is as follows: After opening the anterior chamber from above, Baehr systematically massages the lens surface with a crooked glass rod for several minutes. Five days later he extracts the lens. He claims excellent results by this method, the lens shelling out easily, the wound closing rapidly, and secondary cataracts being quite exceptional.

W. T. S.

The Resolution of Choked Disk in Cerebral Tumor.

FLATAU, (*Muenchener Medizinische Wochenschrift,* April 4th, 1905), reports a case of brain tumor occurring in a young girl, the symptoms manifesting themselves during convalescence from a mild attack of enteric fever. The choked disks which were present, and the general subjective symptoms responded most favorably to lumbar punctures in combination with a mercurial treatment; the choked disks receded and the patient was discharged practically well and with normal vision. Three months later, however, the patient died, the cerebral and ocular symptoms recurring. Autopsy revealed a glioma of the left cerebellar hemisphere. Flatau attributes the marked improvement during the patient's first course of treatment to the series of lumbar punctures, which were resorted to, rather than to any influence the mercury may have had, the punctures having as their object the diminution of intracranial pressure. He supports this view by quoting von Bergman, Devic-Cournmont, Bruns, Saenger and Finkh, all of whom have seen resolution of choked disks after trephining in cases of cerebral tumor. Burchardt, Bergner, Dor, Saenger and Gerhardt report similar results after spinal punctures.

To guard against subsequent blindness Flatau suggests doing lumbar puncture in all cerebral affections associated with choked disk, referring in particular to the cases of meningitis occurring in childhood. If done according to Quincke's method, the operation is not dangerous. W. T. S.

The Diagnosis of Trachoma.

JUNIUS, (*Muenchener Medizinische Wochenschrift,* April 18th, 1905). This is a criticism of the stand taken by Prof. Peters on the trachoma question by Junius of Magdeburg. Junius recognizes trachoma and follicular conjunctivitis as two distinct diseases, and those cases of chronic trachoma during their incipiency as "conjunctivitis follicularis suspecta." He further states that though not every affection characterized by granulation is trachoma, a fresh case of trachoma without granulations cannot exist. Peters, on the other hand, considers the granulations and even the consequent pathological changes as of little importance in the diagnosis, basing his diagnosis on the existence of a proliferation of the sub-epithelial meshwork of adenoid tissue. Such a proliferation may give rise to granulations, but not necessarily. The cases without granulations are classified by him as abortive forms. Lastly, he states the disease can only be acquired by those having a predisposition to the formation of abundant adenoid tissue. If this predisposition exists, the exciting cause of trachoma, whatever it is, will cause an increase of the normal adenoid tissue; if there is no such predisposition, the abortive forms result without such connective tissue or granulation production.

Junius questions Peters' ability to recognize an increase of the normal adenoid structure and censures him for not giving data from personal observation in regard to this predisposition theory. That the abortive forms mentioned above have ever caused trachoma in another individual, has also never been proven. W. T. S.

The Relationship Between Abnormal Ocular Phenomena and Symptoms in the Distribution of the Vagus.

ROSENBACH, (*Muenchener Medizinische Wochenschrift,* March 28th, 1905), refers to Schoen's article on certain anomalies of eye muscle innerveration (vertical squint) causing disturbances of the cardiac and gastric functions, a symptom complex almost analagous to the one advanced by Rosenbach. These symptoms, including pneumogastric disturbances, such as respiratory oppression, palpitation, flatulence, thoracic and abdominal myalgias, and increased sweat secretion of the head, were all associated with an ocular manifestation, such as a marked hyperemia of the palpebral conjunctiva involving chiefly the upper eyelid. The attacks bore a striking resemblance to those of nervous asthma, and at times to nervous dyspepsia. In other cases, in addition to above symptoms, Rosenbach has recently called attention to a marked dilatation of the temporal artery, and that this dilatation, with the symptoms referable to the vagus, disappeared for a variable period of time after the instillation of cocain. An irritability of the nasal mucous membrane frequently associated itself with the conjunctival hyperemia.

Rosenbach recognizes two kinds of cases:

1. Those in which there is a primary ocular disturbance, with secondary derangement of other parts.
2. Those in which ocular symptoms are part of a general disturbance, the congestive or plethoric form.

Cases of the first class are cured by treating the eye; in the second class local measures may alleviate ocular symptoms, but the whole condition is only effectually treated by the administration of laxatives, dietetic and hygienic regulations.

In this connection Rosenbach, after comparing the attacks of migrain with those of scotoma scintillans, refers to a number of cases in which he has positively determined the scintillans to be associated with a hyperemia of the palpebral conjunctiva, affecting particularly the outer and uppermost portions, and in many cases characteristic tender points were found in the nose. Where such eye conditions were present, the changes were apparently brought about by mechanical agents, such as heat, smoke, dust, etc.; in other cases, eyestrain played a part, and in still others, the digestive apparatus was at fault. Gradual changes in the blood supply of the conjunctival mucous membrane of the nose give prodromal periods characterized by epigastric oppression, clear vision, flickerings, etc. In such cases, the attack can be prevented by suitable remedies.

W. T. S.

SOCIETY MEETING.

BRITISH MEDICAL ASSOCIATION.

Seventy-Fourth Annual Meeting, Toronto, August 21, 22, 23, 24 and 25, 1906.

SECTION OF OPHTHALMOLOGY.

President, Robert Marcus Gunn, F.R.C.S., London.

Vice-Presidents, George Herbert Burnham, M.D., F.R.C.S. E., Toronto; John W. Stirling, M.D., Montreal; Joseph Nelson, M.D., Belfast; Arnold Lawson, F.R.C.S., London.

Dear Sir—The subjects which have been chosen for discussion are:

1. Tuesday, August 21—"Rare Forms of Chorioiditis." Opened by Mr. J. B. Lawford, London. The following will also take part: Dr. Hill Griffith, Manchester; Dr. H. Knapp, New York; and Dr. C. Bull, New York.

2. Wednesday, August 22—"Sympathetic Ophthalmia." Opened by Dr. G. H. Burnham, Toronto. The following will also take part: Dr. Chas. A. Oliver, Philadelphia; Mr. Arnold Lawson, London; and Dr. J. W. Stirling, Montreal.

3. Thursday, August 23—"Affections of the Lacrimal Passages." Opened by Dr. Osborne, Hamilton. The following will take part in the discussion: Dr. Risley, Philadelphia; and Dr. Theobald, Baltimore.

4. Friday, August 24—"Visual Tests for Public Services." (*a*) "Marine and Railroad Services." Opened by Dr. T. H. Bickerton, Liverpool. Dr. Williams, Jr., Boston; Dr. Thomson, Sr., Philadelphia; and Dr. Allport, Chicago, will also take part. (b) "Military Services." Opened by Mr. Arnold Lawson, London.

The following papers are also promised:

"On Treatment of Lacrimal Stricture." Mr. Brailey, London.

"On Sympathetic Degeneration." Mr. Freeland Fergus, Glasgow.

"On the Work Which Can Be Performed by a One-Eyed Man." Mr. Freeland Fergus, Glasgow.

"Plastographic Tests for Binocular Vision." Mr. Freeland Fergus, Glasgow.

"On Accommodation After Middle Life and Its Practical Importance." Dr. Edward Jackson, Denver.

"On Treatment of Stricture of Lacrimal Passages." Mr. Brailey, London.

"Relation Between Muscular Imbalance and Gastric Symptoms." Dr. Lucien Howe, Buffalo.

"Obstruction of Central Retinal Vein (*Lantern Slides*). Dr. F. H. Verhoeff, Boston.

"Tenotomy of Inferior Oblique as a Remedy for Some Forms of Ocular Deviation." Dr. Alex. Duane, New York.

"Recent Cases of Wood Alcohol Poisoning." Dr. Casey Wood, Chicago.

"Sympathetic Ophthalmia After Mules' Operation." Dr. W. G. M. Byers, Montreal.

"Dislocation of the Eyeball." Dr. James Moores Ball, St. Louis.

We shall be pleased to know whether you propose to take part in either or all of the discussions, and whether you desire to read a paper. We are, dear sir, Yours faithfully,

JAS. M. MACCALLUM, B.A., M.D., C.M.
13, Bloor Street W., Toronto.
DUNCAN N. MCLENNAN, M.D., C.M.
126, Bloor Street W., Toronto.
Honorary Secretaries.

REGULATIONS FOR THE CONDUCT OF SECTIONS.

1. Papers at the Sectional Meetings must not occupy more than fifteen minutes in reading, and no subsequent speech must exceed ten minutes.

2. Authors are requested to send short abstracts of their papers not later than Tuesday, May 15th.

3. The text of papers submitted for publication in the "British Medical Journal" as part of the report of the Section should represent what is actually read in the Section.

4. Each author should hand the text of his paper in proper form for publication to one of the secretaries of the Section immediately after it is read, or at the latest at the end of the day's meeting of the Section. Neglect to comply with this request may result in the omission of the paper in question from the proceedings of the Section published in the "British Medical Journal."

5. Papers read are the property of the British Medical Association, and cannot be published elsewhere than in the "British Medical Journal" without special permission.

6. Authors of papers not read have no claim for the publication of their papers in the "British Medical Journal." Papers cannot be taken as read. If not read they form no part of the proceedings of the Section. BY ORDER.

CIRCULAR LETTER FROM DR. DEBECK.

SEATTLE, WASH., *May* 1, 1906.

DEAR DOCTOR:

In the unprecedented and frightfully disastrous conflagration that has practically wiped out the metropolis of our coast, one of the only two good ophthalmological libraries of this section was destroyed.

The stubborn optimism that is shown makes it certain that the city will again rise—splendid—from its ashes; and we want to help in this: at the point where we can help best. The Seattle library (founded on my own private library) will do what it can in the way of duplicates, but this can be but little.

We would be very grateful for any contributions of your works, monographs, reprints, etc., and of any duplicates from your library (no matter how old the editions). Especially would we be grateful for any odd volume or volumes of any of the ophthalmological journals, in any language (no matter how old or incomplete). We want to make up, as far as possible, something like sets of the periodical literature.

Small parcels we do not feel presumptious in asking our friends to kindly send by mail, to the undersigned. Those generous enough to get together parcels of any considerable size, may send them to P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Pa. The express charges to the West are so burdensome, that we make this arrangement so that they may be assembled, and forwarded by freight. We will make arrangements with them to pay small express charges at their end. Yours fraternally, DAVID DEBECK,

Ex-Sec'y & Librarian Pacific Coast Ophthalmological Society.

502-5 Alaska Bldg., or Seattle Public Library, Seattle, Wash.

SOCIETY REPORTS.

SECTION OF OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

I.

Meeting February 20, 1906, DR. G. E. DE SCHWEINITZ, *Chairman, Presiding.*

Dermoid Cyst of the Orbit.

Dr. Wm. Campbell Posey presented an Italian child, aged 5 years, upon whom he had done a Kroenlein operation for the removal of a Dermoid Cyst of the Orbit. Similar growths had been removed from the orbit when the child was aged 2 and 4 years respectively, but on account of the extension of the tumor far into the posterior part of the orbit, its complete removal was impossible and the growth had recurred. The tumor, which was removed by Kroenlein's procedure, was situated at the upper and outer angle of the orbit, just below the orbital rim.

No difficulty was encountered with the rapid performance of the various steps of the operation, but after the wedge of bone had been loosened, it was found impossible to keep it in position and it was temporarily removed from the wound. The cyst was found directly underneath the orbital ridge.

Healing was complicated by infection, the wound sloughing. The triangular segment of bone which was replaced before the wound was closed evidently necrosed, as a small sinus remains, through which several small sequestra of bone have been extruded. Notwithstanding extensive exploration of the orbital contents, and free dissection of the tissues, the reaction following the operation was slight, and the function of the extra-ocular muscles was not interfered with.

Dr. Posey presented a second case of dermoid cyst, which occurred in a boy 6 years old. The tumor in this case presented all the signs of an empyema of the anterior ethmoidal cells, as it appeared as a firm, circumscribed, non-movable tumor, in the upper, inner angle of the orbit, directly over the region of these cells. The true nature of the case was only revealed at the time of operation. Rapid and uncomplicated healing followed the complete extirpation of the growth.

Cerebrospinal Menginitis.

Dr. Posey exhibited a photograph taken from a case of Cerebrospinal Meningitis, which afterward proved fatal, in which a *marked dilatation of the palpebral fissure* upon both sides and a *wide dilatation of the pupils* could be clearly demonstrated. The writer thought these signs to be unusual, and attributed them to a stimulation of the cervical sympathetic. He pointed out that Randolph, who had examined 35 cases of cerebrospinal meningitis, had made no mention of these symptoms, though he had frequently found conjunctivitis and changes in the pupils, and a majority showed a tendency to venous engorgement of the retina and optic neuritis.

Two Cases of Orbital Abscess.

Dr. Posey further reported Two Cases of Orbital Abscess secondary to necrosis of the superior maxillary bone, occurring in infants. In the first case, a baby 10 weeks old, a swelling appeared upon the side of the face when this child was three weeks old, which caused the eyelids to close. In a few days pus discharged from two openings on the alveolar margin of the gum of the same side, and from several openings along the lower rim of the orbit; some weeks later several small sequestra of bone were extruded through these sinuses. Several weeks after this, it was noted that the veins over the scalp, particularly on the same side, became very prominent, and a condition of acute hydrocephalus developed, the fontanels opening. Mercurial inunctions were prescribed, as it was deemed that the condition had been caused by syphilis, and under this treatment the size of the head decreased, but the general condition of the child became worse, and death ensued in a few weeks.

The diagnosis of syphilis in this case was further substantiated by the birth some time later of an 8 months' fetus which showed marked signs of specific lesions.

The second case occurred in a child 6 months old. Both parents were healthy, and there was no history which pointed to a specific origin of the affection. Both eyes had been inflamed after birth, the inflammation persisting for six weeks and being accompanied by discharge from the nose. When the child was about 3 months old, an abscess formed in the superior maxillary bone, which required incision along the alveolar processes, and the floor of the orbit. Later, the pus burrowed into the post-cervical region, requiring incision in that locality. Discharge of pus from the orbit persisting, a curvilinear incision was made about 2 cm. long at the lower outer angle of the orbit, the sinuses being split up and the bone laid bare. Extensive necrosis of the rim and floor of the orbit and of the anterior surface of the superior maxillary being encountered, the dead bone was thoroughly removed by the curette. Free drainage was obtained by inserting a tube into the bottom of the orbital wound and bringing it out through the cheek below. The progress of the case was favorable, but an acute bronchitis prevented its exhibition before the Section.

Ethmoiditis.

Dr. Posey also exhibited a photograph of a boy who had been operated upon for Ethmoiditis, in whom repeated incisions had been made into the orbit by a colleague, in the belief that the abscess was one of idiopathic disease of the orbit.

Cavernous Angioma.

Dr. S. D. Risley showed a case of large Cavernous Angioma of the lower lid in a child 3 months old. The method of electrolysis was first employed, and subsequently Erichsen's ligature was applied. The mass sloughed off without hemorrhage, healing was rapid and the final result was very good. Dr. Risley thought the procedure adopted was the safest in so young a child.

Bilateral Gumma of the Orbit.

Dr. F. C. Parker (by invitation) reported a case of Bilateral Gumma of the Orbit in a girl 8 years of age. The firm, immovable mass on each side extended the whole width of the orbital margin. No specific history was obtainable, but microscopic examination confirmed the diagnosis. The growths gradually disappeared in 15 months under the combined use of anti-syphilitic and *x*-ray treatment.

Dr. Posey referred to a case of Nevoid Growth of the Lid, which was made to disappear by Wyeth's method of injection with hot water.

Dr. Harlan showed a case of Very Large Nevus of the Upper Lid and Forehead, in a child 2½ months old. It was treated by Erichsen's ligature, but recurred, and the patient subsequently fell into the hands of a general surgeon. Repeated efforts were made to secure the vessels by subcutaneous ligature, but it was found necessary to excise one portion, while the remainder was treated by injections of boiling water, and by the actual cautery. The growth was finally removed, but the eyeball was exposed by extensive cicatrices of the lid.

Dr. de Schweinitz said that the admirable result in Dr. Risley's case justified the procedure, although he thought that in a certain number of these cases, as Knapp had pointed out long ago, and as seemed to be the opinion of general surgeons, the best results were obtained by excision and dissection in the ordinary manner, an operation, moreover, which was often unattended with any severe hemorrhage, owing to a membrane-like encapsulation of the cavernous tissue. He realized, however, that many cases could not be reached satisfactorily with this surgical procedure. Electrolysis, ligation, sometimes even the actual cautery, were required, according to the conditions which were present.

Dendritic Keratitis.

Dr. B. Alex. Randall presented a drawing of an Exquisite Case of Dendritic Keratitis in man of 52, who had come with a typical episcleritis of the left eye and a distinct rheumatic history clearing promptly under aspirin. This was followed by corneal involvement three days later, the lesion resembling a delicate spray of seaweed upon the corneal surface. The termination of each filament broadened into a vesicle, and then smoothed down under treatment with dionin and internal administration of quinin; but faint and superficial opacity remains, which has not yet cleared under Pagenstecher's ointment. There was a former malarial history but no recent attacks.

Double Chorioidal Coloboma.

Dr. Randall also presented a patient with a Double Choroidal Coloboma drawn 20 years ago for Dr. Norris at the University of Pennsylvania, now having retinal hemorrhages probably of nasal causation. The large rounded colobomata are separated by portions of normal or slightly disturbed chorioid directly above from the disks and have changed little, if at all, in twenty years. Striated hemorrhages have appeared from time to time at the disk-margins without macular lesions or chorioid involvement. The kidneys seem normal and the lesions have disappeared promptly under alterative measures, without splotches or other vestiges remaining. The ethmoids are discharging muco-pus, but improving under conservative treatment, and no other cause has been discernible for the retinal involvement. He also presented a sketch of a colobomatous anomaly of the iris in a man of 30 years, in which no translucency was present in the lower part of the iris; but its entire breadth was traversed by a prominent raphe with a slight nick of the pupillary margin. The tissue on the nasal side seemed to override the temporal almost like the edge of a buttoned garment—an anomaly which was in his experience unique.

Optic Nerve Atrophy.

Drs. G. E. de Schweinitz and E. A. Shumway exhibited a patient with Optic Nerve Atrophy, resulting from the toxic action of methyl-alcohol, with the following history:

In December, 1894, the patient during the course of two days drank three-quarters of a pint of methyl-alcohol diluted with water. At the end of this period he was seized with vomiting and nausea, followed by rapid blindness, which was complete for 48 hours. Then there was a rapid return of vision, and the patient was enabled to pursue his vocation of house-painting, and it is said could read. This period of restored vision lasted for nearly 4 months, when there was gradual failure, so that now the vision is ${}^{6}/_{45}$ in the right eye and ${}^{6}/_{80}$ in the left. Both optic nerves are greenish-white in color, and the vessels of both systems are shrunken. The case is interesting on account of the long period of restored vision, namely 4 months, and the apparent cessation of the atrophic process, which has lasted now more than a year, with a vision which enables the patient to get about, but not to perform any accurate work.

Bilateral Metastatic Ophthalmitis.

Because of the serious prognostic import of Bilateral Metastatic Ophthalmitis, in so far as life is concerned, especially when the condition has arisen in connection with puerperal pyemia, Dr. G. E. de Schweinitz reported an instance of this character, the patient being a primipara aged 28, and the infection having appeared on the fifth day after the birth of her child, although she did not come under ophthalmic care until four days later, when both eyes showed extensive annular abscess of the cornea, followed later by elaborate ophthalmitis requiring for the relief of pain evisceration of one eyeball. The patient was highly septic when admitted; the secretion from the conjunctiva and from the centers of the eyeballs contained in great abundance streptococci, abscesses which formed in the perineum and over the tendon of the left elbow-joint contained the same micro-organisms, and there was also a muco-purulent discharge from the uterus, the cavity of which contained some grayish-white exudate. There was no endocarditis. The blood cultures were sterile. The patient gradually recovered, although for days the prognosis was most gloomy, owing to the sepsis and the persistent vomiting.

Dr. Hansell referred to two children who had recovered from cerebrospinal menginitis. One patient had lost both eyes, and the other one eye from metastatic ophthalmitis.

Dr. Harlan said that he had seen several similar cases during an epidemic of cerebrospinal meningitis. Dr. Chance had examined 70 cases, but had seen no metastatic involvement of the eye. Dr. Ziegler thought the sterility of the blood in Dr. de Schweinitz's case might be due to a possible carrying of the infectious products by the lymphatic system. Dr. de Schweinitz concluded that it might be accounted for by the fact that the blood examination had not been made until the eleventh day, while the ocular infection occurred on the fifth day, and the organisms might have disappeared in the interval.

Pigmentary Degeneration of the Retina.

Dr. W. Zentmayer presented (1) a patient, a female, 48 years of age, with the subjective symptoms of Pigmentary Degeneration of the Retina. In the right eye there were but two or three fine specks of free pigment. In the left there was somewhat more pigmnet. In both eyes the epithelium appeared unusually white, with numerous brilliant points and beginning hyalin degeneration especially marked upon the papilla. The arteries were much contracted; the veins but little. The nerves were characteristic. In each eye V. = $^6/_7$ pt. The field of O. D. showed more contraction for form than did that of O. S., but in the latter the color field was the more restricted (down to within 10 degrees of fixation) and there was a horseshoe scotoma extending from the vertical meridian above to 45 degrees below the horizontal meridian and from 10 to 20 degrees in width. Night blindness had existed for 10 years. Neither consanguinity nor heredity played a part.

Dr. Zentmayer presented (2) a second case in a boy practically unable to navigate in the dark. There was a history of a fall with compression symptoms and trephining of the skull. The nerves were not characteristic, but had more the appearance of consecutive atrophy. The peripheral pigmentation was quite marked. The fields were concentrically contracted. V. = $^5/_{20}$.

Retained Hyaloid Artery.

Dr. Zentmayer exhibited (3) a case of Retained Hyaloid Artery, together with a circumscribed defect in the chorioid in the upper part of the fundus. The retinal vessels projected beyond the plane of the retina and from their surface there sprang a connective-tissue cone continued as an attenuated cord, terminating at the posterior capsule in a disk surrounded by a zone of delicate, rucked tissue. The chorioidal defect was about the size of the disk. The superior vein skirted its edge.

Dr. Pyle referred to two cases of retinitis pigmentosa without pigment in brother and sister. The periphery of the eyegrounds showed some stippling. There was a history of night-blindness in a paternal grandfather.

Removal of the Lens in High Myopia.

Dr. Howard F. Hansell reported a case of Bilateral Removal of the Lens in High Myopia, with the subsequent use of dionin. The patient, a boy of 19, had myopia in the right eye of 21 diopters and in the left of 23. In addition to the usual posterior staphyloma there was foveal degeneration of the right eye from the chorioidal atrophy and extravasations of blood. In the left, during the year he was under observation, he had had no less than 15 small hemorrhages in the fovea. As a result of this pathologic process, vision was rapidly declining, and he had been obliged to give up his occupation. The right lens was superficially needled and in seven days the lens mass removed. After complete recovery, the left eye was similarly treated. The pupil of each eye is clear and unobstructed. V. in R. + 1 c. ax. 135° = $^{20}/_{70}$; in L. + 1 ◯ + 3 c. ax. 135° = $^{20}/_{50}$. The patient has had no recurrence of hemorrhage in either eye since the operations. It is difficult to draw conclusions from the literature as to conditions that warrant the removal of the lens for the cure of high myopia. High and progressive myopia is almost, without exception, not only associated with, but the cause of, extensive posterior staphyloma, fundus changes, foveal atrophy, chorioidal degeneration, and hemorrhagic tendency in the fovea, and these same are named as the contraindications. Dr. Hansell believes that myopia of 15 D. or more, known to be progressive in spite of careful refraction, independent of the common changes at the fundus, is suitable for operation, because (1) progressive myopia invariably leads to atrophy of the chorioid and degeneration of the retina at the posterior pole; (2) the effort to see clearly by reason of the diminished images seen through strong glasses and the necessity for strong light induces severe and constant strain that in itself tends to increase the myopia; (3) the highly myopic individual is debarred from many occupations; (4) removal of the lens, by curing myopia checks the further degeneration of the fundus. The absorption of lens remnants and tags of opaque capsule was materially aided by the use of dionin, commencing with 2 per cent. increasing to 5 per cent. and finally to 10 per cent.

Dr. Risley recalled the case he presented to the Section last year, in which the myopia was 34 D. and the extraction of the lens had resulted in V. = $^{20}/_{70}$ +, with — 8.00 D. $\supset$ — 2.00 c. ax. 180°.

In that case there were no recent inflammatory changes and no evidence of progressive myopia. In January of the present year he had adopted the same procedure on the fellow-eye, viz., a cautious cutting of the anterior capsule. This was followed by no unusual reaction or swelling of the lens, but on the second day the man lost all perception of light. On the fifth day there was some pain and increase of tension. The lens was removed and the eye progressed without further incident, but without recovering light perception. The blindness, he thought, was due to total separation of the retina. Dr. Risley said he had always opposed extraction of the lens in malignant myopia and had consented to the operation in this case because of the long absence of any inflammatory change in the chorioid, and the helpless condition of the young man with M. = 34 D., which dated back to early childhood.

EDWARD A. SHUMWAY, M. D.,
Clerk of Section.

II.

Meeting March 20, 1906. Dr. G. E. de Schweinitz, Chairman, presiding.

Embolism of the Central Retinal Artery.

Dr. S. D. Risley showed for Dr. Harlan a case of Embolism of the Central Artery of the Retina. The patient was a negro 26 years of age, and the eye had become suddenly blind while he was reading the newspaper, 20 hours before the first examination. At this time the pupil was slightly dilated, and there was no light perception. The whole fundus was of a bluish-gray color from retinal edema, and the typical "cherry-red" spot was at the macula. The retinal arteries were invisible on the disc, and could scarcely be traced beyond it. The veins were about normal in size and of an arterial red color, and the current was beaded but without apparent movement. The patient had had "spasms" when a child, which disappeared until five years ago, since which time he had been subject to attacks of epileptic convulsions three or four times a month. Heartbeats were rather weak, but there were no signs of valvular disease. Two days later the red spot was replaced by one of dark gray, and there was a striated hemorrhage at the temporal margin of the disc.

Some Forms of Hereditary Cataract.

Dr. Casey Wood, of Chicago, read (by invitation) a paper on Some Forms of Hereditary Cataract. He believes that if by the term "cataract" one means any opacity of the crystalline lens or its capsules, it is not difficult to make out a case for the hereditary character of senile cataract, especially as changes in the transparency of the lens are rather the rule than the exception in persons above the age of 65. Other forms of cataract occasionally occur in a family series that make it fairly certain that hereditary influence enters as a probable causative factor. He gave the histories of three series of familial cataract. The first was in a family, a member of which was sent to the author by Dr. T. B. Charlton, of Clinton, O. In this instance a woman 33 years of age was blind with lamellar cataract. Her great-grandmother had, and her mother at the present time, has cataract and, most remarkable of all, five brothers and four sisters of her own "childships" of 12 are the subjects of juvenile cataract. Altogether, in this series of 31 individuals representing four generations, 11 members have cataract, all of them of the presenile variety.

The second series is that of the Hussa family. In three generations (of about 46 individuals) 12, and perhaps 14, had and have cataract, all of the juvenile type.

For various reasons the most instructive of all of these familial series is that of the Ira Smith family. Although the number of cataractous patients in this family is not large, there are some peculiarities about the lenticular disease worth noting. In the first instance the opacities did not develop until comparatively late in life, although they were noticed in both eyes at or about puberty. In five of six instances the patients were operated on after they had reached 60 years of age. With one exception these operations were failures, and with this exception, also, the blindness set in from glaucoma without apparent infection and after the primary wound had healed. Three cataractous eyes were operated upon. Nevertheless, in these three instances the patients became totally blind from secondary glaucoma. Another noteworthy fact in this family is that in three patients there was a temporary return of vision, *i. e.*, the cataractous lens regained sufficient transparency to enable the patient, previously blind, to go about without difficulty and to see fairly well. The writer was able to remove a cataract from one of these patients after failure to do an extraction on the other eye in the same individual. The operation upon the lost eye went through the same course that other eyes in the family previously treated pursued. Owing to these peculiarities extracted lenses were sent to Dr. Adolf Alt, of St. Louis, who reported that the lenses contained a number of crystalloid nests, probably lime deposits, prismatic in form, base out, apex toward the center of the apparently spherical cavity. He regards this condition as rare, since he has seen but one other specimen, which showed similar crystalline formations in the lens. The writer believes that the clearing up of the cataract in the three members of the family—a transparency that almost always preceded the glaucoma from which the patients became ultimately blind—occurred from the absorption of exudates between the nests of lime salts, due to active changes in (with swelling of) the lenticular substance. In five of the six eyes that exhibited this "clearing" of the lens the patients were able to read, with a magnifying glass, coarse print for a time, and to make out medium-sized objects about the house.

So far as could be determined, in none of the three series was there a common incident, apart from the occurrence of cataract; no consanguinity of parentage, no congenital defects, no tubercular, syphilitic, or scrofulous habit. None of the cases examined had glycosuria. Those that reached old age seemed to be as well as people of their time of life generally are.

Commenting on Nettleship's monograph, the writer drew attention to the fact that few American authors had been referred to in his bibliography, although Howard Hansell, Millikin, A. D. Williams, A. R. Baker, J. L. Dickey, and others have contributed to the subject. Few authors have discussed the actual part played by hereditary predisposition in familial cataract, and it must be admitted that therein lies the chief difficulty. What are the principal factors? Do they consist in anomalous development of the nutritional apparatus of the lens system, or are they systemic peculiarities common to members of the afflicted childships? Again, are they organic defects in the lens structure (as is probable in the case of the cataract examined by Alt from the Ira Smith family) and handed down from one generation to another?

Precise answers to these questions undoubtedly call for further examination, not only of the ocular structures, but of the subjects exhibiting hereditary cataract.

Dr. Risley felt much indebted to Dr. Wood for his interesting and instructive paper, but was much impressed by the fatality following efforts at extraction. He regretted that Dr. Wood had not read all the details set forth in his paper as to the method of extraction pursued in the one successful case, and inquired whether the lens had been extracted in its capsule.

This method, he thought, commended itself if, as Dr. Wood believed, the bad results in the other cases were due to the retained portions of the lens adherent to the capsule.

Dr. Risley reported briefly seven members of one family, Pennsylvania Germans, who had been under his care at the Wills Eye Hospital during the past fifteen years with cataract. Six of them had been operated upon successfully, five for discission, one by extraction. One case was lost by purulent panophthalmitis following the third discission operation. They were all feeble-minded.

Dr. Ziegler reported a family in which cataracts had appeared in five members. In one case there was a zonular cataract on one side, which ripened and was extracted, and a fluffy opaque capsule in the other, which he had excised. He had also seen a second series in a physician's family, the father and two of his children having zonular cataracts.

Dr. J. L. Dickey, of Wheeling, W. Va., spoke of the five series of cases which he had already repeated. In one series every female member of the family had developed cataract after the age of 30 years. He had operated on a case of traumatic cataract in a man of 21 years, and had found the lens calcareous throughout.

Dr. Pyle had seen two brothers of a Pennsylvania German family who had dislocated, cataractous lenses, with colobomata, both of whose parents had been operated on for cataracts.

Dr. Wood said in answer to Dr. Risley's question that in the first case he had made an attempt to extract in the capsule, but it was unsuccessful. In the second case he had used irrigation with salt solution. All of his cases were in good physical health and showed no other congenital defect.

Retinitis Proliferans.

Dr. W. Zentmayer exhibited a case of Retinitis Proliferans. The patient, a man 27 years of age, came to the hospital for the removal of a foreign body from the cornea. Examination of the fundus showed an extensive bluish-white membrane with new-formed blood vessels, extending from the disc almost to the macula in advance of the retina. Vision was unimpaired. The history was negative. The patient never had had any disturbance of vision. While in this case there were no evidences of previous hemorrhages, in a case seen by Dr. Zentmayer several years ago the condition had been preceded by recurring hemorrhages. Dr. Zentmayer referred to the recent anatomical report of a case of retinitis proliferans by Cirincione. In the papilla there existed a new formed tissue of slender fibrillae, collections of round cells, and large bundles of fibrous tissue continuous with the fibrous coat of the papillary vessels. The retina was greatly thickened by a superficial layer of fibrous tissue parallel to the retina. Toward the papilla this layer blended with the retina, but at the periphery they were separated. Beneath this layer there was a membrane made up of every form of cellular element with a fibrous layer in which there were blood-vessels showing arteritis obliterans. In the retina the most marked changes were in the fiber layer and in the internal granular layer, these being replaced by new-formed tissue. He considers the disease a local one, due probably to an irritant condition of the vitreous acting principally on the adventitia of the vessels of the papilla.

Vernal Conjunctivitis.

Dr. Zentmayer presented a patient with Vernal Conjunctivitis (periodic hyperplasia of the conjunctiva) who had been treated with the Roentgen rays by Dr. Sweet. The case, which had been an unusually pronounced one (illustrated in the text-book of Hansell and Sweet), shows only a small localized mound of hyperplastic conjunctiva at the limbus. During the past summer the eyes appeared perfectly normal. In a second case the treatment had not been so faithfully pursued, but the relief had been very marked.

The cases were not presentd as "cures," but to show the beneficial effects of the treatment.

Dr. Wood spoke of Dr. Allport's patient, who had been cured apparently for two years. He had a patient of his own who had been free from the condition for one year, since treatment with *x*-rays, but he thought care should be taken not to claim a cure until there had been no return for at least two years.

Dr. de Schweinitz had had only one case treated by this method, but the number of applications had been insufficient. He was skeptical with regard to the ultimate cure of these cases by the *x*-ray, by radium, etc. Most of the results have been only temporary, but the method was worthy of further trial.

Dr. Carpenter agreed with Dr. Wood as to the necessity of waiting more than one year before claiming a cure. Many patients, like hay-fever patients, were occasionally entirely free from their discomfort throughout an entire season. He had seen a patient who had had severe attacks for six years, and under treatment with tannin and glycerin had been entirely free last summer. He did not think it justifiable, however, to consider the case cured by this treatment.

Macular Fatigue and Central Scotomas in Certain Psychoses.

Dr. de Schweinitz, after briefly describing the visual field phenomena, which pertain particularly to the periphery of the visual field in the various types of neurasthenia and hysteria, discussed certain symptoms which interpret macular fatigue: namely, small central relative color scotomas or blurs, paracentral scotomas, central scotomas simulating those produced by toxic amblyopia, and large central exhaustion scotomas. The method of detecting the small relative color scotomas with millimeter test objects was described, and the importance of this condition in relation to proper refractive work was fully developed. The paracentral scotomas which were figured were believed to represent fragmentary ring scotomas, which in their turn might represent a certain stage of the so-called oscillating visual field. The difficulty which the large central exhaustion scotomas and central scotomas simulating toxic amblyopia present from the standpoint of diagnosis was fully discussed, particularly the differential diagnosis between these functional conditions and various types of retrobulbar neuritis.

Dr. Hansell spoke of the possibility of making a wrong diagnosis in cases of psychical central scotoma, unless the macular regions were carefully searched for fine lesions, and toxic amblyopias were excluded. Myopes also exhibit rapid exhaustion of the retina, which renders accurate measurement of the visual field very difficult.

Dr. Risley said it was in precisely these cases that it was difficult to secure normal vision when testing the refractive error. Letters often disappeared or were suddenly displaced. He spoke of a typical case of neurasthenia in whom he had been unable to secure full vision until after a week's rest at the seashore.

EDWARD A. SHUMWAY, M.D.,
Clerk of Section.

III.

Meeting April 17, 1906. Dr. G. E. de Schweinitz, Chairman, presiding.

Unusual Success from Iridotomy in Eyes Practically Blind From Iridocyclitis and Complicated Cataract.

Dr. Wm. Campbell Posey exhibited a female, 62 years of age, in whom vision was brought from $^1/_{70}$ in the right eye and 1-2-70 in the left to $^5/_{36}$ in both eyes, by extensive iridotomies. The poor vision had resulted from iridocyclitis with pupillary occlusion and temporary cataracts. Both lenses were removed with iridectomies, but the pupillary area was so blocked by lymph and lenticular debris that vision was but little improved. Repeated needlings failed to obtain a clear area. The writer pointed out the advantages possessed by iridotomies performed with the De Wecker scissors over other forms of procedure in cases of this nature. He called attention to the importance of carefully studying the axis of greatest traction and the desirability of incising the iris in a direction at right angles to this. The incision should be large and any resulting reaction should be combatted with ice compresses, boric acid and atropin solutions, and the administration of the salicylate of soda internally. He said that De Wecker performed the operation after either one of two methods, that of iritoectomy or iritodialysis, and gave the details of both of these procedures.

V-Shaped Iridotomy: Knife-Needle vs. Scissors.

Dr. S. Lewis Ziegler presented a brief historical review of the various methods of iridotomy proposed during the past two hundred years. This showed a constant oscillation from incision of the iris membrane by the knife-needle to excision of the same by the scissors through the open corneal wound. While all preferred the knife-needle, many were forced by frequent failures to adopt the scissors. Cheselden, the father of iridotomy, originated the method of incision by the knife-needle, which Adams later revived and improved. Von Graefe set the seal of his approval on the knife-needle method as being superior to all others. On the other hand, Janin first devised the method of using scissors through a corneal wound, while Maunoir later made a triangular flap, which procedure De Wecker elaborated and perfected until it stands today as the best recognized method.

Iridotomy is now confined to cases of aphakia in which cyclitis and iridochorioiditis have resulted in membranous occlusion of the pupil. In such cases the knife-needle has the following advantages: ease of incision, lack of traction on the ciliary body, less subsequent inflammation, no loss of fluid vitreous, and avoidance of a scar from corneal incision. There are several essentials of success: (1) a good knife-needle, preferably a modified Hays knife-needle; (2) a V-shaped incision, and (3) skillful manipulation of the knife-needle to avoid escape of aqueous, to make no pressure in cutting, and to place the corneal puncture and membrane counter-puncture as far apart as possible.

The writer's method consists of puncturing the cornea above, passing across the anterior chamber, swinging the knife, 2 mm. to the left of the vertical plane, making a counter-puncture in the iris membrane by a dart-like thrust, and without pressure making a saw-like motion until the knife reaches the apex of a supposed triangle. As this opens up, the knife is swung up through the opening, and passed across the anterior chamber to a point 3 mm. to the right of the vertical plane, where counter puncture is again made, and a similar incision executed up to the apex of the triangle, thus forming a V-shaped incision. The knife is then quickly withdrawn. The resulting pupil should be either triangular or oval, depending upon the resiliency of the tissues. This procedure has been in constant use for the past seventeen years, and has proved efficient in more than 90 per cent. of all cases. It is equally applicable to simple cases of secondary capsular cataract, or to mixed cases of iridocapsulotomy.

Dr. Hansell said that the operation which he had found to be the most successful, in cases in which the pupil was drawn upward, was an incision near the lower corneal margin, through which Tyrrell's hook was introduced. The iris was caught with this, and drawn downward, tearing an opening in the occluding membrane.

Dr. de Schweinitz stated that he believed the condition of the iris should largely decide which one of the various operations described should be employed. When the iris was in good condition and the pupil central and excluded by the exudate, to which also the posterior surface of the iris was more or less adherent, he believed it wise first to perform an iridectomy, and subsequently cut the exposed membrane, the exact character of which could be explored at the time of the operation, either with a very narrow Graefe cataract knife, or in the usual manner with De Wecker's scissors after puncture and incision of the membrane with a narrow keratome. In most instances he believed it better to cut out a triangular portion of the membrane rather than make a simple incision across the tensest portion of the fibers. In some cases, however, such simple incisions, especially if performed with a sharp Graefe knife, were singularly effectual. He described and discussed Dr. Knapp's operation of iridocystectomy, which, following that distinguished surgeon's directions, he had at one time performed, and in some instances with great satisfaction. He had in recent years, however, abandoned it for the procedure already noted. If the iris is drawn up into the angle of the wound, distorted and atrophic, and presents little hope of being satisfactorily removed in the performance of an iridectomy, he would have recourse at once to De Wecker's iritoectomy, which has already been described in Dr. Posey's paper.

He did not doubt that Dr. Ziegler's V-shaped iridotomy, performed with a modified Hays knife-needle, was equally efficacious, although he had himself not practised the operation. He had seen it performed by Dr. Ziegler with great success.

Dr. de Schweinitz also referred to certain types of complicated cataract, especially such as following sympathetic iridocyclitis, in which the drilling operation, usually called Critchett's operation, yielded, he thought, better results than any other operative procedure, and referred to one or two notable successes which he had achieved with this method.

In closing, Dr. Posey said that in cases of pupillary occlusion, he preferred the incision with scissors where it was a question of opening the pupil through the iris, whereas he thought that the knife-needle was better adapted to cases where the capsule itself must be incised. He had had most excellent results follow iridotomy with De Wecker scissors in other cases, particularly in the not uncommon type where a small pupil remained near the limbus above after complicated healing in cataract operations. In this class of cases a large incision across the iris usually gives most excellent results.

Dr. Ziegler in conclusion said that he had frequently seen De Wecker perform his operation most skillfully, but that he occasionally lost considerable vitreous, which he considered very dangerous in certain cases. He had also seen Galezowski operate, but his incision was a crucial one instead of the T which his book describes, thus following the practice of Guerin. The condition referred to by Dr. de Schweinitz, where the pupil is drawn up to the top of the anterior chamber, was the exact type of a case this operation had first been performed upon with success, the visual result being $^{20}/_{50}$. The second successful case was that described in the paper, where various methods had previously failed because of a tough membrane and a tension of —3. In reply to Dr. Posey's remarks, he would say that while De Wecker's method was very successful in the case exhibited, the mere fact that there was a soft iris membrane was not at all a contraindication of this V-shaped method with the knife-needle. He had recently operated on several similar cases, which he hoped to show in the near future.

A Case of Chorioidoretinal Sclerosis with Spontaneous Dislocation of the Lenses, Partial and Complete.

Dr. William T. Shoemaker showed this case, the underlying pathological conditions of which were degeneration, atrophy, and sclerosis, affecting the retina, the chorioid, the optic nerve, and the crystalline lens with its suspensory ligament. In the right eye the lens was cataractous and partially dislocated, in the left eye the lens was free in its capsule in the floor of the vitreous.

The fundus of the left eye was a most striking example of degeneration. The essential points were, complete atrophy of the nerve, the vessels were reduced to lines, the reduction apparently being due not to a diminished lumen alone, but to an actual reduction of the vessel in all its parts. Pigment was of several varieties, *i. e.,* retinal pigment, wandering and forming grotesque figures, and pigment gathered in masses, some round and some irregular, in different parts of the retina. Little is known of the changes which take place in the suspensory ligament in cases of this kind, but it may be supposed to fall a victim of the general starvation; to relax, to become attenuated, and to fail in function.

Dr. Shoemaker calls attention to the statement of Camill Hirsh, that pigment in the retina can come but from four sources, viz.: first, from the pigment layer of the retina; second, from the chorioid; third, from the blood; and fourth, from iron introduced into the eyeball—siderosis.

Insomuch as the normality of the pigment layer of the retina depends upon the chorioidal circulation, and is not influenced by disturbance in the retinal circulation alone, all cases of acquired pigment in the retina, not due to traumatism, hemorrhage, or siderosis, should have the double descriptive title of chorioido-retinal. The name of pigment degeneration or atrophy of the retina, while much better than that of retinitis pigmentosa, is still defective in that no credit is given to the chorioid, which probably plays an important, if not an indispensable role in this distinctly degenerative and sclerotic process.

Persistent Hyaloid Artery, Both Eyes. Unusual Variety, Left Eye.

Dr. William T. Shoemaker presented this case. The persistent hyaloid in the right eye was of the most usual form, *i. e.*, attached to the disk, with free end in the vitreous. In the left eye the anomaly was of a most unusual variety, and, so far as the author knows, one not previously noted. The neural end of the artery and its sheath had entirely disappeared, as well as the lenticular end, with the exception of three or four very fine strands of the vascular tunic of the lens, which remained apparently attached above to the ciliary process, and at the other end to a good-sized remaining section of the artery. This section of hyaloid, therefore, lay longitudinally in the vitreous a little below the axis, with its free end directed backward, and its forward extremity suspended from the ciliary processes by three or four remaining strands of the vascular tunic of the lens. No opacities remained in the posterior lens capsule.

Dr. de Schweinitz said that he had examined Dr. Shoemaker's second case, and that it was unique, so far as he knew. No similar case is noted in De Beck's monograph.

A Case of Vesicular Keratitis, with a Filamentous Formation of the Detached Epithelium.

Dr. Burton Chance described a case, the features of which were as follows: A young woman received a slight injury to the cornea, which caused the appearance of a large epithelial bleb. This burst, and exposed the true cornea, and loosened the surrounding epithelium. Several days later a faint diffuse edema, with an irregular track of infiltration was noticed. For many days it was impossible to reapply the loosened epithelium, and when at last the surface was covered the cornea became studded with over thirty tiny vesicles. In the course of a day or two these vesicles burst, and instead of being cast off from the cornea, their walls remained attached by narrow pedicles, which by the action of the eyelids were moulded into scrolls or filaments which were ultimately torn off. No signs of infection of the true cornea were observed, during the evolution and involution of the vesicles. The eruption of vesicles was repeated several times during a period of several weeks.

Various plans of treatment were pursued without avail, until all of the filaments were scraped off, and pure tincture of iodin was applied to the surface of the cornea. The patient was kept in bed for two weeks. The cornea has now a healthy appearance, and the vision is only slightly reduced. The exfoliated fragments were composed only of degenerated epithelial cells.

Dr. Chance believed the condition to have been one of neuropathic disease of the cornea, in association with a lithemic or rheumatic diathesis—somewhat of the order of herpes, involving at first a single locality. Because of a great loss of the protecting epithelium, a general edema of the cornea was excited. The loosened epithelium hindered the steady onward flow of the serous fluid, so that it escaped from the lamina, and was held beneath the epithelium in the form of droplets.

Dr. Zentmayer said that Dr. Chance's case presents clinically a picture which superficially resembles filamentous keratitis, but pathologically is quite a different affection. In cases of herpes the filament is purely a mechanical product resulting from the whipping of the denuded epithelium into threads, whereas in filamentous keratitis the filament is due to a diseased state of the corneal epithelium, as a result of which the epithelium becomes elevated as a cone, the cells and their contained nuclei greatly lengthening and twisting, the resulting fiber often terminating in a globule made up of cell detritus. He believed the treatment which had cured the case of herpes would aggravate a case of filamentous keratitis, as he had found that mild astringents, especially weak solutions of ammonium chlorid, were the most efficient measures in the treatment of the latter disease.

Dr. Carpenter believed that the patient had suffered from an unusual form of herpetic keratitis. He was, at the present time, treating a woman, aged 46, with recurring crops of herpetic vesicles scattered over the cornea, rupturing in 24 to 48 hours, but leaving no shred-like epithelial processes, such as were present in Dr. Chance's patient. The etiology was plain, as the malarial plasmodium was found in the blood, and the patient was suffering from chronic malarial poisoning. The attacks were usually cut short by large doses of quinin.

In conclusion, Dr. Chance said that he did not consider the case one of filamentous keratitis, but thought that the formation of the filaments in the herpes blisters was unusual. Mild measures had had no effect.

Unilateral Exophthalmos of Traumatic Origin.

Dr. Wm. Zentmayer presented this case. The patient was an Italian, 27 years of age, with an exceptionally good personal and family history. On November 21, 1905, the left eye suddenly proptosed, and since then there has been little change, unless slightly for the better. One month previously, while helping lift a very heavy beam, the weight was suddenly thrown upon him, giving him a severe strain. The proptosis is very marked. The eyeball is practically fixed, the sixth nerve being completely paralyzed. The conjunctival vessels are greatly engorged. There is a soft mass below the upper margin of the orbit which is most marked at the inner angle. There is neither bruit nor pulsation, and the eyeball cannot be replaced into the orbit. The edges of the nerve-head are hazy and the veins are much distended. In the other eye the nerve-head and surrounding retina are greatly swollen, and there are profuse retinal hemorrhages (thrombosis of the central vein). There was no disease of the accessory sinuses, and the Roentgen rays showed no shadow behind the eyeball. Dr. Zentmayer said that he believed the condition to be due to a small rupture of the carotid within the cavernous sinus, resulting in a thrombosis which has extended to the cavernous sinus of the other side. The result of tying the carotid artery would be questionable, but would be advised as at least a preliminary step to the method of Sattler for treating such cases.

Dr. de Schweinitz thought that the case did not present the most favorable features for ligation of the common carotid, and that, while ordinarily this operation is to be recommended, in the present instance it might be worth while to try the effect of the recumbent posture, compression of the carotid artery, and the administration of large doses of iodid of potassium.

Dr. John T. Carpenter showed the patient and described the fundus of a young man who was thrown from an automobile, striking his head. The ophthalmoscope showed about six irregularly-shaped areas of retinal exudate, yellowish-white in color, with woolly edges. There were also superficial retinal hemorrhages, slight obscuration of the nerve edges, and moderate swelling of the disk. The picture was strongly suggestive of albuminuric retinitis. Vision was reduced to $^{1}/_{60}$, but was improving under treatment with mercury, the iodids, atropin, and rest.

Dr. de Schweinitz described the following case: A young man, aged about 20 years, was injured by a log nine feet long and twenty-two inches in diameter, which rolled over him. He was unconscious for three hours. No fracture was demonstrated, either of the skull; the trunk, or the extremities. Two weeks later he was examined in the University Hospital, and complete left external ophthalmoplegia found without paralysis of accommodation, while on the right side there was complete paralysis of the abducens, with marked paresis of accommodation. In addition there was a moderate bilateral optic neuritis. At first there was some mental confusion and a slight febrile reaction, which rapidly disappeared under treatment, and when the patient left the hospital his general condition was good, although there was little or no change in the ocular muscle conditions.

Dr de .Schweinitz discussed at some length the possible causes of such palsies, which might be due to fracture of the skull, to hemorrhage, to pressure of exudates at the base of the brain, and, finally, to hemorrhage or concussion of the nuclei of the ocular muscles in the aqueduct of Sylvius. He thought in the present case that hemorrhage into the nuclei themselves explained the left complete ophthalmoplegia, while the right abducens might readily have been injured by the fracture, or pressed upon by the exudates of a meningitis or by hemorrhage, which in turn would account for the neuritis.

Dr. de Schweinitz also exhibited a patient who, immediately following the blow of a fist upon his right eye, had complete paralysis of the right internal rectus and paresis of the right external rectus. Crossed diplopia characteristic of internal rectus palsy existed in all portions of the field of fixation, except in the extreme outer portion of the right field, where the diplopia immediately became homonymous and characteristic of external rectus palsy. The blow of the fist had probably produced a hemorrhage which had so distributed itself as to press upon the two involved nerves. There were no ophthalmoscopic lesions, except some edema of the macula, and no paresis of accommodation.

Dr. Carpenter related the history of a boy who had received a severe blow on the head followed by symptoms of traumatic meningitis. There was at first spasmodic convergence followed by optic neuritis with bilateral palsies involving principally the sixth and the third cranial nerves. Under mercury and iodids the patient made a complete recovery.

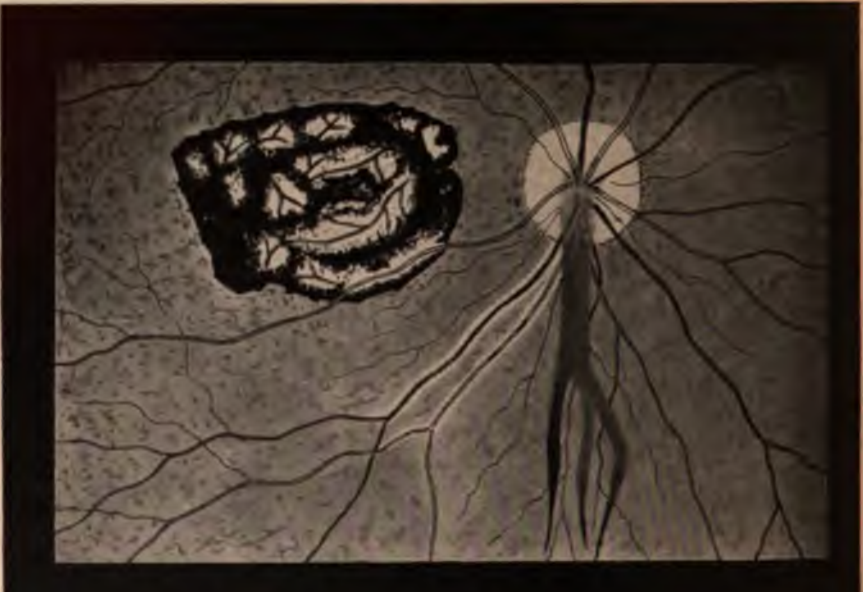
An Ocular Transilluminator.

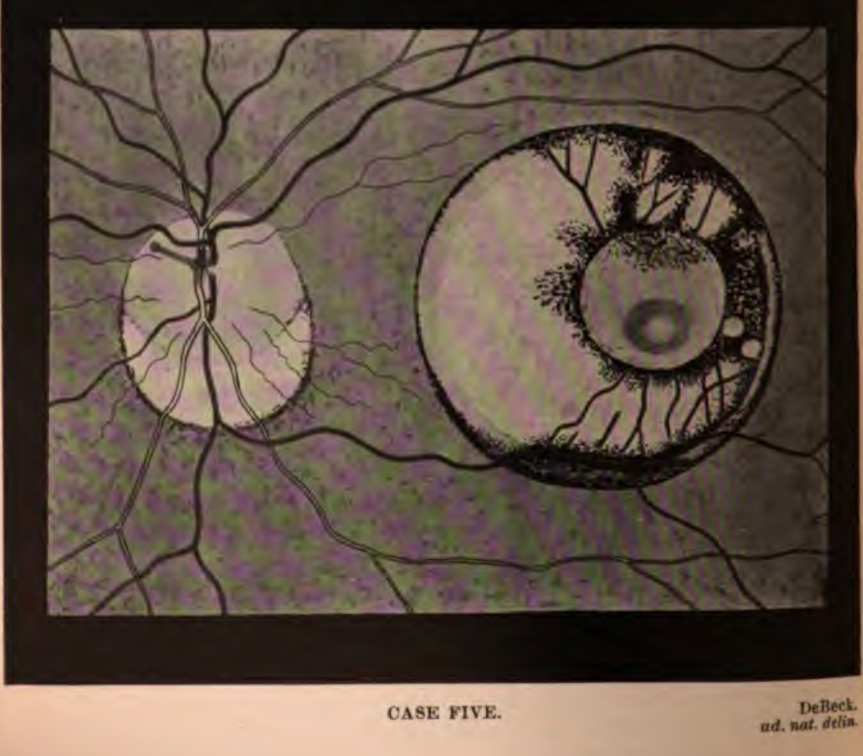
This was shown by Dr. Ziegler. This instrument was devised by Wuerdemann, and consists of a miniature electric lamp of 5½ volts, having a small but powerful condensing lens on the end of the bulb. As it is made by the De Zeng-Standard Co., of Philadelphia, it can be mounted in the hard-rubber handle of the De Zeng luminous ophthalmoscope. Attached to this is a hard-rubber tip containing a cylindrical glass rod three-fourths inch in length and 5 mm. in diameter, which is ground and polished flat at both ends, the inner end being held in contact with the condensing lens on the end of the lamp bulb. All of the light entering the glass rod or conductor at an angle of approximately 90 degrees is transmitted by the rod to the object, the principle employed being that of total reflection. The tip is so small that the light can easily be transmitted through the ocular tissues, and the illumination is so great that it is possible to see the details of the fundus with the naked eye. The instrument is smaller, handier, and more efficient than the larger instruments of Sachs, Leber, and Rochon-Duvigneaud. As the lamp and rod are practically cold, there is no danger of heating the eye.

Edward A. Shumway, M.D.,
Clerk of Section.

CASE SIX.

Plate 4.





CASE FIVE.

DeBeck.
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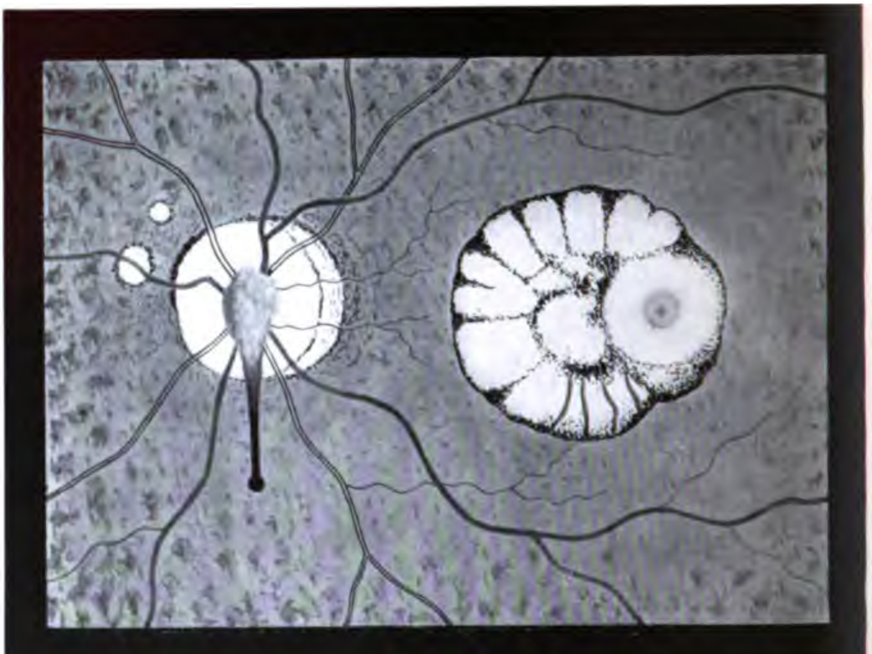
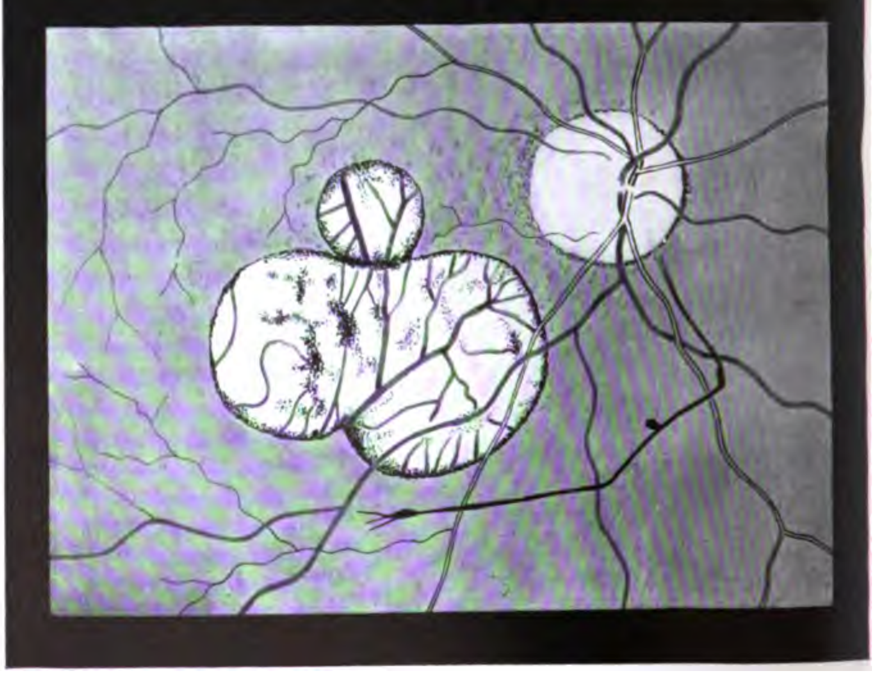
Plate 3.

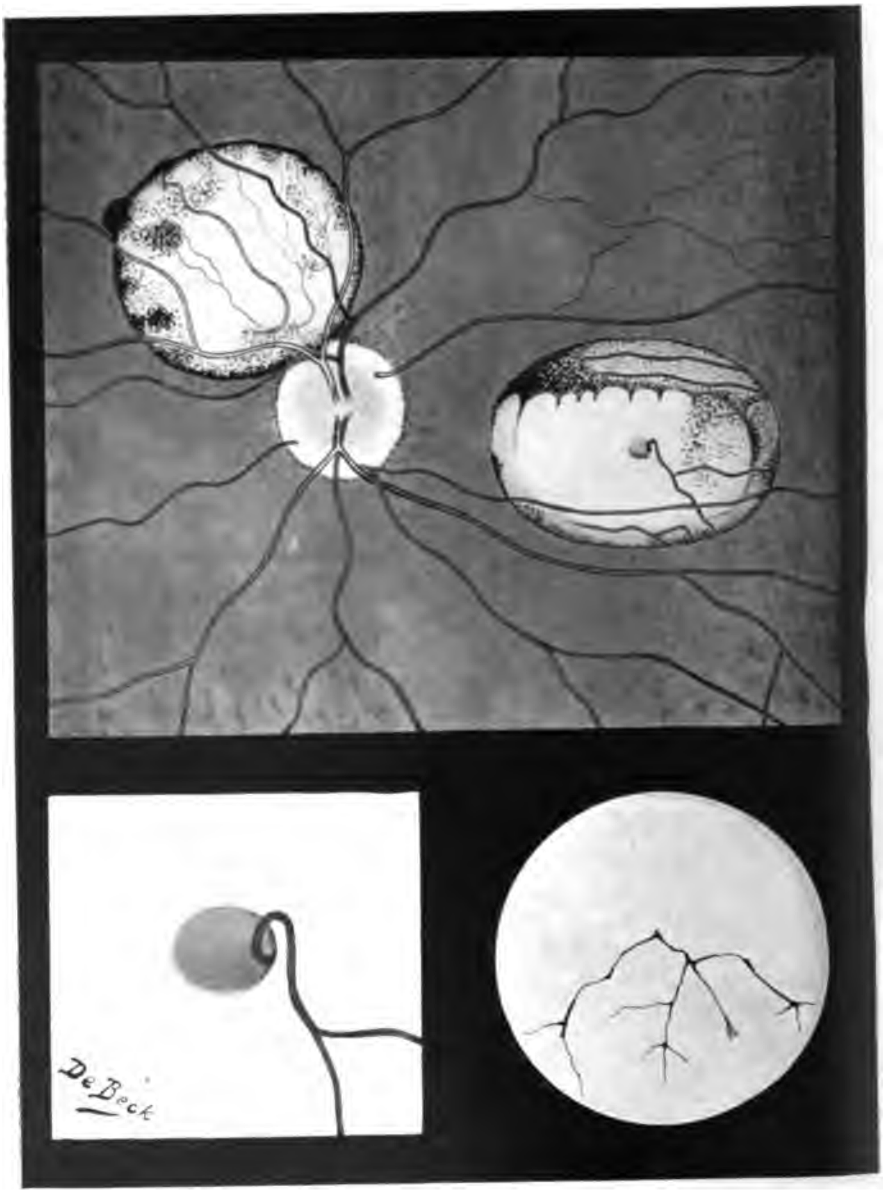
CASE FOUR.





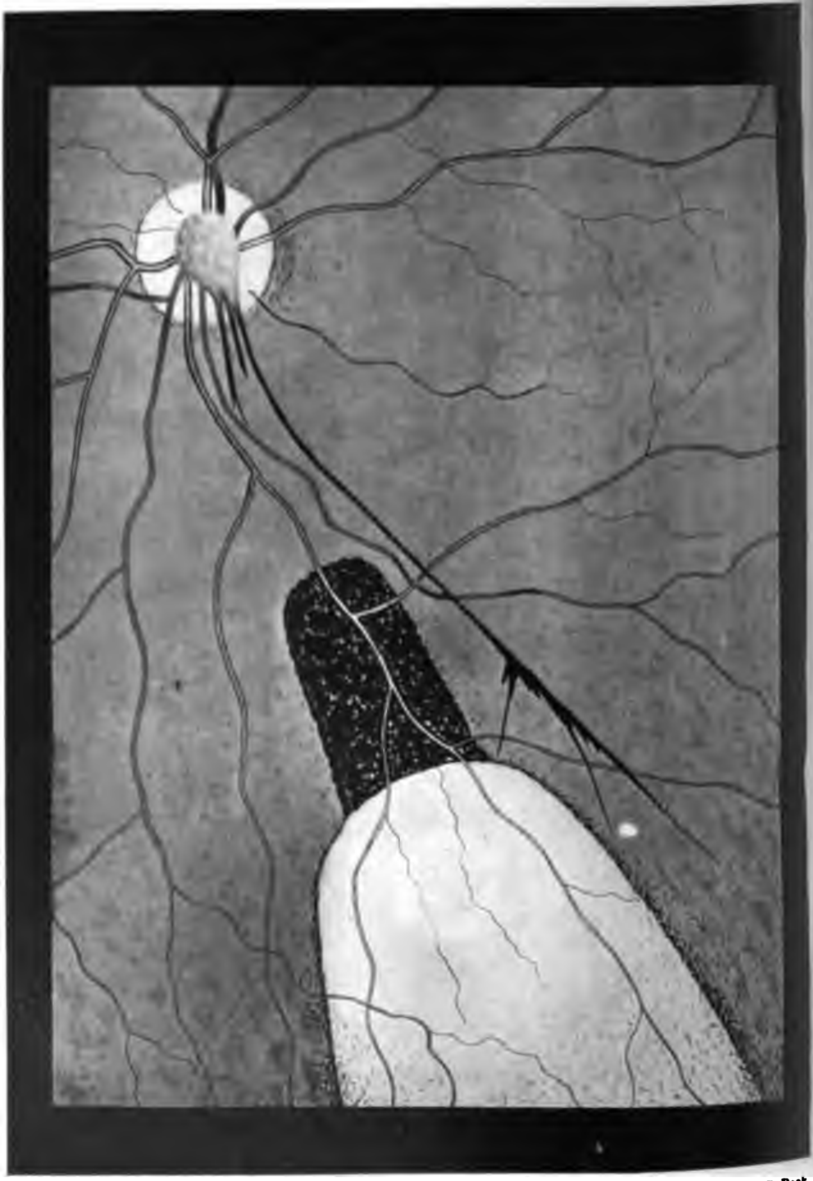
CASE THREE.

DeBeck.



CASE TWO.

DeBeck.



CASE ONE.

DeBeck.

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SOME CASES OF ASSOCIATED COLOBOMA OCULI AND ARTERIA HYALOIDEA PERSISTENS.

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I have had exceptional and quite remarkable luck in having had under observation, at various times during the last twenty years, no less than five cases in which there have been associated colobomata of the intra-ocular tunics with persistence of some remnant of the fœtal hyaloid artery. Such a group in itself seems worthy of permanent record; and the individual cases may clear up or support views as to the genesis of these congenital defects.

Case 1—Miss Kate L——, Aet. 27 (stenographer, Covington, Ky., 1895). Came on account of an inflammation of the right eye, which in the course of ten days had reduced its vision to quite as low a point as that of the left—and always poor eye. I found a sub-acute, sero-plastic iritis, with one synechia below. V=20/70.

I could find no certain etiological basis for this; and was inclined to charge it to a terrific dysmenorrhœa with which she suffered every month—to promptly subside upon the onset of the menstrual flow. At any rate the iritis also subsided under a mydriatic; and before ceasing the use of this a refraction test showed H. of 1.25 D., with V=20/30. She was given this for work.

In the left eye the lower part of the fundus showed an unusually regularly outlined coloboma—it presenting an almost exact parabola. This area was white above, with a central circle of glittering reflex showing a faint greenish tinge; while toward the periphery it showed a mottled greenish reflex, with fine granular pigmentation. Projecting from the upper edge was a pyramidal pigmented area (almost equally regular), roundly truncated above. This was narrower than the coloboma, and reached almost half way from the upper coloboma-margin to the lower disc-margin. The general effect was strikingly like the picture of a heavy caliber siege gun—aimed at the disc.

The coloboma is crossed by an artery and its branches, and by a branch of one of the veins. The fundus of the neighborhood shows mottled pigment changes in the choroid; there is a narrow zone of the same around the disc; and a much fainter mottling in the macula region. V=20/50—.

The center of the disc is, covered by a grayish tissue-mass, from beneath which the vessels emerge. From this clump three strands project forward: one short one, only about half the length of the disc-diameter, ending in a bluntish point; another about the length of the disc-diameter, ending in two sharp pointed divisions; and the persistent hyaloid artery proper. This projects well forward into the vitreous. It keeps of quite uniform diameter, until near the end; where it thickens quite decidedly. From this thickened part branch out two long and about half a dozen short spurs—very like the barbs of a fish spear. It ends finally in a long, delicate, pointed termination. The strand is freely movable in sinuous waves, on movements of the eye.

CASE 2—Henry R——. Aet. 43 (Mill hand, Covington, Ky., 1898). Came on account of most annoying paralytic ocular troubles. I found the left eye with V of 5/200: an old amblyopia, dating from earliest remembrance. This eye diverged (this being, however, the passive divergence that so often comes on in a long since practically useless eye). Under forced fixation the amplitude of rotation was approximately normal. Recently there had occurred an oculo-motor paralysis of the right (good) eye. Besides the annoyance caused by the pupillary and ciliary paralysis, the eye was fixed in marked divergence. The ptosis was but moderate. Thus to secure vision directly forward the head had to be kept strongly rotated to the left, and a trifle thrown back; a most uncomfortable and disagreeably conspicuous poise—reminding one of an aggravated case of torticolis. V=20/70; but with + 1.25s ⊃+1.25c 90° this was corrected.

I could find absolutely no etiological basis for this ophthalmoplegia, except that he had recently suffered from malarial fever. As I was at that time working up the malarial affections of the eye—I may have been all too ready to attribute symptoms to this cause. I diagnosed a minute nuclear hemorrhage (malarial). At any rate under quinine, movements were regained: a trifle past the median line inward; about 20° upwards; and 12-15° downward. Then the case passed from observation (I soon after left for the West) and was never followed to any conclusion. Possibly the improvements may have spontaneously occurred under any treatment or under none—we know how uncertain prediction is in these cases.

In the left eye was found quite a nice little collection of congenital anomalies. The disc showed a simple atrophy, with saucer-like shallowing. Tangent to its upper nasal edge was an almost circular (slightly oval) area, about twice the diameter of the disc. This is sharply outlined by a pigment border; and has some clumps of pigment-dots around its outer zone. It is crossed by a retinal artery and vein; and has a small artery and two veinules that begin and end upon it. It is (notwithstanding its atypical position) unquestionably a chorioidal coloboma.

Occupying the macula region is a beautifully symmetrical oval about twice the length of the disc-diameter, and about one and a half disc-diameters high. I think no one will question this being a "macula coloboma"—if this term is to be applied to *any* condition! It has an outer zone below, of a faint salmon-pink tint; the center is white, with the faintest bluish reflex; and crossing it above are a series of little arches of pigment, reminding one of the picture of an old Mission porch. Three little vessels, proper to it, cross it transversely; one near the lower border and two above. At its exact center is a small oval depression of darker contrast. Into this disappears a little vein which has been formed of two branches which appear at the lower-outer edge. It is difficult to examine such an erratic eye with absolute exactness; but this gives the impression almost of a sharply "punched-out" cavity. The coloboma focussed with —3.00 D., the little cup with about —9.00 D. At the disc no trace of any remains could be detected, but the plain mirror revealed a clear picture in the vitreous; a picture of a rather unique type of persistent hyaloid artery. A central point (or short strand) was firmly fixed and immobile. This sent two branches forward: a longer one to divide into two branches, and a shorter one to divide into three and ultimately into nearly a dozen fine branches. All these branches were movable in vermiform movements on any rotation of the eye. The whole structure gave one the impression that it was "floating in the water"—like a bit of sea-moss.

CASE 3—M. D. McI——. Aet. 34 (U. S. Int. Rev. guager, Covington, Ky., 1896—later Sheriff of Kenton Co.). Came for ordinary asthenopic trouble. V=20/50 in the right; not improved. V=20/30 in the left, corrected by + 1.25 D. This was given for near work. In the right eye there was noted a tri-lobate area (evidently a coloboma) occupying the macula region and the region below it; its upper-inner margin coming within half a disc-diameter of the lower-outer edge of the disc. Its upper lobe much smaller than the disc; the outer lobe somewhat larger than the disc; and the inner lobe nearly twice the area of the disc. It is crossed below by a retinal artery and a vein; and has a rich net-work of vessels of its own. Among these is easily distinguished one evidently a branch of one of the venæ vorticosæ. It has scattered clumps of pigment; and is sharply outlined by a pigment border.

At the disc it is hardly possible to make out the almost transparent origin of the persistent hyaloid; but it soon comes into clear view as a dark strand traversing the vitreous. About half-way forward it has a nodular protuberance from one side; and it ends in a fusiform enlargement. From this spring three little terminal filaments. Its appearance is strikingly like a little snake's head; especially when it moves about on movements of the eyeball.

CASE 4—Miss Mary M——. Aet. 22 (Cincinnati, O., 1888). Came on account of poor vision. V=20/200 in the right, with myopia of 3.00 or 4.00 D., but the correction not greatly improving it. V=counting fingers at 10 ft. in the left, with about the same myopia—but not improving. There were narrow myopic crescents; chorioidal pigment disturbances; and some small areas of chorioidal atrophy in each eye. In the right there was a broadened "frayed-out" persistent hyaloid remnant. In the left eye (here figured) the point of exit of the vessels upon the disc was completely covered by a funnel-shaped, pale gray expansion. This passed forward, gradually tapering, became cylindrical, a trifle thicker than the largest vein, and terminated in a very distinct round knob nearly twice the diameter of the shaft. It moved slowly to and fro on movements of the eye. About 12 D. would focus clearly upon its end. These persistent hyaloids I have previously described[1]

The coloboma (found only in the left) is here described for the first time. It occupies the macula region; is almost perfectly circular; and is about twice the diameter of the disc. It is sharply outlined by pigment; and has little pigment septa-like lines passing into it, dividing it into almost regular compartments, reminding one of an orange cut across. Crossing it below are four little vessels, appearing at the lower edge, and disappearing behind a strand of pigment. In the outer quadrant the septa are replaced by a circular area, with a faint bluish reflex (the rest of the coloboma is clear white). At the center of this circle is a faintly outlined smaller circular area (apparently a shallow depression), with a lighter ring within, and a darker dot at the center. This gives one much the picture that we get of a red blood-cell under the microscope in one position of the focussing. This smaller circular central area has a tinge of a shade darker tone of slatey blue.

I think also that no one will question this being a "macula coloboma."

CASE 5—Miss Annie E——. Aet. 18 (domestic, Cincinnati, O., 1892).—Came on account of poor vision. V=15/200 left, and 20/50— right. This was mainly amblyopic, for the correction of a moderate compound hypermetropic astigmatism did not give sufficient improvement to compensate her for the added annoyance when cooking or laundrying. In the left eye the macula region was found occupied by a wonderfully symmetrical circular area—almost as exact as if laid down with dividers. This was about twice the diameter of the disc. It had (as in Case 2) an outer zone of a light salmon or grayish pink tone, the general surface being white. It had a sharply outlined pigment margin; and the pigment was somewhat massed in the upper, lower and outer portions, and around a smaller, circular central area.

It is crossed below by a retinal vein and branch; and has some vessels proper to it crossing it, more or less vertically, above and below. These in all cases appear at the inner edge of the outer zone, and disappear at the pigmented edge of this inner circular area. The lower ones look, at the first casual glance, as if they were branches of the retinal vein, but close inspection shows this to be not the case. The outer quadrant (as in Case 4) is occupied by a smaller circular area. This gives a faint bluish reflex, but unlike the other example this has some pigment dotting over its upper segment; and among this three little twigs of vessels appear and disappear. Lying excentrically toward the lower edge in this area is a smaller transverse oval area, which looks like a shallow depression. It has a slightly darker tinge of grayish blue. Its center in turn shows a still smaller transverse oval, that shows lighter by contrast. The picture reminds one most of that of the ovum with its germinal vesicle and germinal spot. The general surface of the coloboma focusses with—1.00 D., and this central spot with —5.00 D.

At the disc there is a rather broad inferior conus,—and the question has been raised whether these be not rudimentary forms of coloboma (of the optic nerve sheath). Springing from the point of the primary division of the retinal artery is a delicate, pale bluish-gray, rounded strand projecting forwards a little way into the vitreous. It is about the diameter of a vessel of the fourth magnitude; and terminates in a little knobbed extremity.

This is a type of little hyaloid artery, practically invisible by indirect ophthalmoscopic examination, and only brought out by careful direct examination, that I think must be quite common (comparatively speaking). I feel sure that I have seen nearly or quite a dozen of them.

CASE 6—John W. W.——. Aet. 48 (This case did not come under my own observation, but occurred in the practice of the late Dr. E. Williams, of Cincinnati, in 1884). He had lost one eye (and presumably a previously good one) by injury and came on account of a "cloud" before the other. I have previously described this case, in the same Monograph, p. 69, Plate X1, Fig. 1; but a brief resume my not be out of place here.

In the macula region was found an irregularly oval area, about one and a half disc-diameters in height, and about two and a half disc-diameters in width. It was deeply pigmented, with some white patches interspersed. It was crossed by a retinal artery below; and showed a number of small vessels crossing the white patches. It may be questioned whether this can be properly called a coloboma. Many observers hold conditions like this to be really examples of the results of intra-uterine chorioiditis (or more properly chorio-retinitis); not essentially unlike the very similar appearances found in some cases of pernicious progressive myopia. The fundus was otherwise normal; except that there was some slight chorioidal "mottling," and the lower temporal artery and vein showed white outlining sheaths.

The disc was pale, and veiling the exit of the vessels was the pale diaphanous base of a tubular-like strand passing forwards into the vitreous. This was of a bluish-gray tint, becoming darker and less transparent as it passed forward. In the center of the vitreous it divided into three branches, all of which were darker than the trunk. The inner two still seemed tubular, but the outer one was darker and seemed solid. All ended in fine dark points, which were not attached to the lens. They moved freely about on movements of the eye. There was a central scotoma corresponding to the macula area, but slightly excentric vision was not impaired; and the visual field was distinctly contracted, due to the optic atrophy.

This was a very excellent, and quite typical example of the persistent "canal of Cloquet."

The association of these two congenital anomalies is by no means unique; as a review of the literature will show.

The association of the persistent hyaloid with an ordinary chorioidal coloboma has been several times reported. One of the very first reported cases, that of *Wallmann*[2] (observed post mortem), presented an iris-coloboma, chorioid-coloboma and a cystic expansion below. A firm white band sprang from the posterior surface of the wrinkled lens to pass back and spread out over the disc; sending some fibres to the cyst margin below.

Goldzieher[3] reports a case with coloboma of the chorioid and nerve. The hyaloid must have been an exaggerated example of the form seen in Case 4 above. There was a cyst-like body, short, thick neck, and round head; the whole appearance leading some observers to the diagnosis of cysticercus, especially as the "head" had gentle to and fro movements. This was due, no doubt, to the movements of the eyeball, and not to any intrinsic movements of the object—and was so decided. *Remak*[4] reports three cases, all of which have some interest in this connection. In one there is a chorioidal coloboma not essentially unlike that in Case 3 above (except being situated more down in the lower quadrant of the fundus —the usual position). At the same time the hyaloid is also very like that structure in the same case (except that there are numerous filiform processes springing from it). In another case of ordinary grayish hyaloid projecting into, and ending free in the vitreous, there was a small, atypical, rectangular chorioidal coloboma (?) adjacent to the disc below. In both these cases there was a fine filament projecting back a short distance from the posterior pole of the lens. In a third case there was a hyaloid with a base much like that in Case 6 above; but terminating in only one fine dark end. In this case there was no ordinary coloboma, but a broad "conus" (half as broad again as that in Case 5 above). Moreover in this case there was a free structure in the midst of the vitreous reminding one slightly of the structure in Case 2 above. This was, however, nothing so complicated; being composed of four little drop-like filaments hanging together—or like two little, long dumb-bells crossed by the handles.

Larsen[5] reports a case of congenital cataract in a boy of 6. After operation there was found a hyaloid passing back from the lens remains to the disc; and a small coloboma of the chorioid.

Eversbusch,[6] *Hess*,[7] *Sulzer*,[8] and *Bayer*[9] all report cases with more or less typical persistent hyaloids, but with the floor of the vitreous chamber not presenting any of the ordinary forms of simple colobomata; but more complicated fibrous strands and masses, evidently remains of the fœtal mesoderm involution. These take the place, as it were, of the ordinary inferior colobomata.

Dimmer[10] and *Guene*[11] also report somewhat similar cases; in which the hyaloids are indicated by conical processes or fibrous masses occupying the optic disc, and from which (especially in Dimmer's case) fine fibres pass forward into the vitreous. From these central masses fibrous strands spread out in various directions over the fundus. These are probably remnants of the earlier embryonal tissue. In both cases there were irregular, atypical colobomata; in Dimmer's case below, and in Guene's case toward the macular region.

The atypically placed coloboma in Case 2 above is not without analogs. *Gunn*[12] reports a case with ectopia and coloboma lentis. The strand representing the persistent hyaloid passes from its insertion at the bottom of the lental coloboma back to a point a trifle above the optic disc. There was a large, bluish-white area *above* the disc, having all the character of a coloboma.

DeSchweinitz and Randall[13] have reported a well known case of atypically situated coloboma. In this case the oval coloboma, about twice the area of the optic disc, was tangent to the nasal border of the disc, a little below the horizontal meridian. The persistent hyaloid (if this it be) consists of a falciform membranous outgrowth arising from the disc and sending both extremities forward into the vitreous. A little detached vesicle floating in front of the nasal edge of the disc may, and probably does, belong to the same system.

These prettily symmetrical (oval or round), macular colobomata such as are seen in Cases 2, 4 and 5 above, have a number of close analogs in the literature; but as regards their association with persistent hyaloid arteries this seems to be of the extremest rarity—even if my good fortune has not been really unique. I can now recall no other examples. The more irregular pigmented forms, as seen in Case 6, and to which one hesitates more and more to apply the term "coloboma" just in proportion as they become more and more irregular in shape, appearance or location, present a few somewhat analogous cases. *Stricker*[14] reports the most closely allied case. The strong, dark hyaloid closely resembled that in Cases 1 and 2 above. The macular patch was almost an exact copy of that in Case 6 above (so far as could be determined from his quite diagrammatic sketch).

Crainiceanu[15] reports a somewhat similar case. The text of the reprint—which he kindly sent me—is Roumanian to me; but from the study of the rather rude half-tone I can quite clearly make out the hyaloid (somewhat longer and darker than that in Case 5 above) curving a short distance out into the vitreous. The macula region presents a patch somewhat intermediate in appearance between those in Cases 4 and 6 above; but with all the surrounding territory (up to, and partly encircling the disc) deeply mottled with massed chorioidal pigment.

Bayer[16] reports a case with a much more anomalous macular patch. This was an obelisk-shaped area, somewhat like the pigmented part of the coloboma in Case 1 above. Imagine that area beginning a little more to the right and passing vertically up through, and above, the macula region; having about this same width (a little greater than the disc-diameter) and a height of 6 or 8 disc-diameters. It showed more open spaces, with crossing blood-vessels of its own, and more scattered massing of the pigment. The disc showed a sheath coloboma; and from its lower edge sprang the hyaloid, passing through the vitreous, and spreading out into a funnel-shaped mass in the upper anterior part of the vitreous. It showed the gray walls of the canal of Cloquet, and through this passed a red strand, *showing that the vessel still carried blood as in the foetal state.* It broke up into branches in the funnel-shaped mass, and through them the blood no doubt finally reached the ciliary region.

In a few other cases of persistent hyaloid there are presented chorioidal patches—but these are so irregular in shape, and eccentric in position, that no fairly permissible stretching of the term "coloboma" can be made to cover them. They must be regarded as purely cases of congenital chorioiditis. Thus *Mitvalsky*[17] reports a case of "para-macular coloboma, with tubular formation," which belong here by title only. The tubular formation springing from the disc passes not forward into the vitreous, but to the upper-temporal quadrant of the fundus, to be there attached. This area of attachment seems to be clearly only an ordinary chorioiditis.

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[1] "Persistent Remains of the Foetal Hyaloid Artery." Cincinnati, 1890, p. 37. Plate IX., Figs. 5 and 6.

[2] Zeitsch. der Gesellsch. der Aerzte zu Wien, p. 446, 1858.

[3] Pester med.—chir. Presse, XIV., Nos. 29 and 30, 1878 (v. Jahresbericht ueber Ophthalmologie, p. 587, 1884).

[4] Centralbl. fuer prakt. Augenheilkunde, IX., p. 9, 1886.

[5] Ungeschrift for Laeger, XX., p. 455, 1875 (v. Nagel's Jahresbericht, p. 185, 1875).

[6] Bericht der 15 ten. Vers. der ophth. Gesellsch., p. 168, 1883.

[7] Graefe's Archiv, XXXIV., 111, p. 148, 1888.

[8] Klin. Monatsbl. fuer Augenheilkunde, XXVI., p. 425, 1888.

[9] Prager Zeitsch. fuer Heilkunde, IV., p. 49, 1883.

[10] Arch. of Ophth., XIV., p. 72, 1885—German Edition, XIV., p. 54, 1884.

[11] Westnik Ophthalmologuii, July-Oct., 1888.

[12] Trans. Ophth. Soc. Unit. Kingdom, IX., p. 166, 1889.

[13] Arch. of Ophth., XVII., p. 454, 1888.

[14] Arch. of Ophth., XXIII., p. 308, 1894.

[15] "Artera hialoidà persistentà," Romania Medicala, p. 289, Iulie, 1894.

[16] Prager med. Wochenschrift VI., p. 342, 1881.

[17] Arch. of Ophth., XXIV., p. 192, Pl. 10, 1895.

THE OPHTHALMIC SINS OF HOSPITALS.

By George M. Gould, M. D.,

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Every hospital in the world, in its construction, management, and medical practice, is a threefold sinner, first, against ocular hygiene; second, against local ocular therapeutics; and, third, against ocularly-related therapeutics. So far as one can discern, not a protest against these abuses has ever been made by ophthalmologists, and no professional effort has been made to correct them.

1. *In the Construction of Hospitals,* architects, building committees, and trustees have not considered the simplest and most fundamental rules as to the influence of natural light and of artificial lighting, upon the eyes. To ventilation, heating, cleanliness, infinite care has rightly been given; concerning them wise forethought has been held necessary, and upon them millions of money expended. Some attention even to the ears, and the teeth of patients is held necessary, as a boiler-making industry is not thought a wise part of hospital plans, and an aching molar in a patient is at once extracted. But as to the eyes the old medieval barbarism of utter inconsideration is perpetuated, unalloyed and unholpen. It would appear as if the endowers, architects, supporters, and administrators had no conception whatever that the eyes were of value or had any relation to the rest of the patient's mind and body. Care to preserve the sick person's visual functions and organs, desire to prevent their deterioration or destruction, does not enter into the count. As to the daylight it has often been most indiscriminatingly thought that the more light the better. This has been chiefly in the interests of cleanliness and asepsis, for, born of long experience, it has been found that where is darkness there is necessarily dirt and disease. The mistake is not unlike that which has clumsily supposed that clear water is pure water. There is no real connection between dirt and darkness except human laziness and negligence. Dirt may and often does exist unseen and in the brightest of rooms. The ideal should rather be to extinguish dirt whether in the light or the dark. But willy-nilly the patients in the wards of the hospitals as commonly constructed are usually compelled to sit in a blinding light, sometimes in the sunlight. Indiscriminate neglect of ocular hygiene is constantly and needlessly increasing the afflictions of those who suffer from

weak, diseased, or ametropic eyes, and all the systemic diseases which spring from eyestrain are intensified and multiplied by the pernicious custom. For a little time light might be allowed to flood the wards, but to insult the eyes with it all the day long is—well, it is insulting. One may, indeed, hope that the absurd lengths of the rage for light, light, and ever more light, may soon be restricted to common sense and scientific limits. The aim should be to secure that cooling, soft, and grateful shading which normal eyes, sensitive organisms, and considerate science instinctively choose. Many hospitals are curtainless, in many the curtains are ordered rolled up all the time, and often the curtains only ludicrously increase the harmfulness of the light-beams shooting athwart the beds and chairs, or stabbing the hurt eyes of the patients who seek in vain to escape. There are a number of diseases, ocular, mental, and physical, directly engendered or increased by brilliant light.

Artificial Light at Night. And if there were allowed the healing and soothing absence of light in the night! But no, the Societies for the Encouragement of Cruelty to Patients will not allow that, and during the whole night some wretched sort of artificial light is ordered to prevent the healing of overstimulated and injured retinal and cerebral organs. Thus amblyopia, ocular and mental, sleeplessness, brain-irritation, and other morbid processes are directly encouraged, convalescence retarded, and some types of nervous diseases directly provoked. The eye is an important organ of the body, and it has pathogenic relations with every other organ. It is worth saving for its own sake, and also for the sake of the others it may profoundly influence.

Reading in Over-lit and Badly-lit Wards. The complete inattention to ocular hygiene in hospitals is again exemplified by the fact that reading, writing, sewing, etc., are permitted without regard to the amount or quality of the light, or at what angle it strikes upon the patient's eyes, his book, paper, etc. Often, with curtains rolled up and windows upon every side, it is impossible for the reader to sit so that it shall not strike his face or his book from all sides. Some of these evils could be much lessened by the use of reading visors, or eyeshades, but they are not ordered.

Then to make up for the over-much and hurtful glare of the daytime lighting, patients are allowed to read at night by an artificial light so inadequate and wretched that the daytime injuries are doubled by those in the evening. In what Training School for Nurses are taught a score of such important laws of ocular hygiene? Do resident and visiting ophthalmic surgeons teach them and see that they are carried out in their hospital wards? Never, or rarely! The nurses are trained in every other conceivable way, trained indeed, often to death, but no one teaches them to care for their own eyes, the laws of their over-use and abuse, the tremendous value of accurate and scientific refraction in carrying on their studies, in preventing ill-health, etc. Pitiful tragedies are constantly recurring because of the eyestrain which they have not been taught to avoid. If ignoring the sources of these their own misfortunes, how can they warn and help their patients in such matters?

Sleeping in Light Rooms is another method of injuring eyes. Most of the hospitals have lights in the wards so that by no device can the patient escape the more or less direct falling of light upon the eyes while sleeping. This is highly injurious to the sensibility of both the retina and brain, and disturbs the refreshing sleep so needed in disease and convalescence. Many patients must sleep in the daytime also, and eyes are constantly injured by the blinding light. In nine-tenths of the sleeping rooms of private houses the bed is so placed that the sleeper faces the light of the windows. I never heard of a physician ordering a change of the position of the bed, and the prevention of ocular injury by screens, etc., is rare. The subject of the location of beds or cots in hospitals as regards the incidence of light is one sadly neglected, and oculists should make the matter clear to trustees, superintendents, etc. The eye is a part of the human body, and too much light, and indiscriminate light, is as bad as too little. Light is for judicious use, as is any other therapeutic measure. Darkness during sleep is a requisite of good hygiene and sound therapeutics.

The Hygienic Use of Spectacles is also absolutely ignored. If the individual patient should possibly ask to have his eyes examined by a refractionist, several things would probably happen: 1. He would be carelessly referred to the Eye Department, if such a department existed. But in many no such department exists, and hence it is next to impossible for the patient to get a prescription for glasses. If there is an eye department, the refraction is done by students and inexperts, and the prescription will not be correct. I have never known of a case (and I have examined a thousand such spectacles), in which correct refraction was done in a hospital. Suppose that the patient secures a prescription, he has to go "down town" to get it filled by the optician. Ten to one he will fall into the hands of a bungler or a quack optician (taking the country and world over) who will charge twice as much as is honest, and who is moreover wholly incapable of accurately fitting and adjusting the frames. Five or ten to one, also, the patient is too poor to buy spectacles. Of the millions of money wasted in charity none thinks of the crying need of poor people of scientific spectacles.

But again the odds are great that no patient will himself spontaneously ask for glasses. He does not know or care about the matter, or is deterred by the difficulties of getting the lenses. And surely never did visiting or resident physicians tell him that, 50 to 1, he needs glasses for his eyes' sake or for the sake of his general health. Do not Doctors Roosa, Knapp, Howe, Dana, Fisher, etc.,—"all honorable men"—publicly aver that eyestrain does not and cannot reflexly cause any local ocular or general systemic disease? The "New Ophthalmology" has no converts among the "Ophthalmic Surgeons," the professors, the visiting and resident physicians, who are placed in charge of hospitals, and hospital wards.

Spectacles as Therapeutic Agents would be the last thing ordered by physicians in charge of hospital patients, or of convalescents from other diseases than ocular ones. These patients afflicted with "neurasthenia," "hysteria," headache, sick headache, diseases of digestion and nutrition, chorea, epilepsy, etc.,—all possibly or usually due to eyestrain—are allowed to read, write, play games, etc., with no thought of glasses, and thus are produced or reproduced the very morbid symptoms for the cure of which they may have come to the hospital! A great authority in diagnosis, a general physician of national and international reputation, has recently said that practically every physician has seen many patients cured of gastric and intestinal diseases solely by means of scientific relief of eyestrain. Is there a hospital in the world in which patients with these diseases are treated by means of spectacles? Not one, and not a text book on these diseases except one even mentions this fact or method of treatment. A surgeon of as great renown says that in pelvic diseases, appendicitis, etc., threatened operations are avoided and his most brilliant cures effected by means of the oculist. Is there a surgical hospital ward or operating room in the world in which this suggestion is heeded? Hundreds of testimonials exist, made by careful physicians, that many diseases of the nervous system and mind are due to eyestrain. Is there a hospital, or home, or colony, in the world in which patients with these diseases, by order of the physicians in charge, are correctly refracted, properly "glassed," and the effects noted? Is there a text book on nervous and mental diseases which emphasizes or even alludes to the fact? The dependence of diseases of women upon eyestrain has often and frequently been shown. Is there a gynecologist, a special hospital ward, or a text book on diseases of women, in which delayed menophania, dysmenorrhea, functional ovarian or uterine diseases, are treated by attention to eyes? The question would make the gynecologist smile with derision.

Such facts illustrate the old and well-known truth that the official "science" of the present date is never "up to date," and is usually an outlived science. Corporate therapeutics is either obsolete or obsolescent therapeutics. The medicine that is most authoritative is too commonly of no authority, and of little efficiency. Except in the chronic and organic diseases, in which death may possibly be delayed, the hospitals, especially in diseases dependent upon eyestrain, are not preventive and too seldom curative. Frequently, indeed, they add to ills of which the patients already had enough.

One of the greatest of scientists and educators has said that "the nervous system of man and animals is primarily a device for making locomotion safe. The sensory organs are the brain's sole teachers; the muscles are its only servants. By far the most important sensory organ is the eye." The logic is inevitable and the conclusion for scientific men, draws itself. The greatest physiologic and biologic functions when made morbid must become equally powerful sources of suffering. Medicine is the pathologic side of biology. Must it be left to lay scientists, and the non-medical, to force that biologic verity upon professional attention and professional practice? The effectiveness of our hospitals as social institutions for the betterment and saving of human life depends infinitely more than has been acknowledged upon the recognition of the truths of "the new ophthalmology."

HYSTERICAL BINOCULAR AMAUROSIS.*

By F. L. Henderson, M. D.,

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Mr. President and Gentlemen:

The compelling force back of this paper was obfuscation of the writer's intellect, confusion on the part of those from whom he expected light and the hope of distilling something concrete and tangible from the elusive and shadowy vapor called hysteria. No attempt will be made to treat the subject in its broad sense, as we all know even the ocular manifestations would fill a volume. Hysterical amblyopia, hysterical asthenopia, hysterical monocular amaurosis will all be excluded and we will confine ourselves to hysterical binocular amaurosis. It is even not my intention to deal with this single subject in its entirety. I intentionally omit the differential diagnosis from gross cortical lesions, which produce blindness without loss of pupillary reaction or fundus change; the methods of detecting simulation, and other interesting features which might well be made the subject of a separate paper.

In looking up the literature of the subject I find Gilles de la Tourette reports eight cases in 1891 as follows: Landouzy 2, Briquet 3, Marlow 1, Levy 1, Wurdemann 1. Wurdemann's, however, was a case of hysterical deafness, which leaves seven reported cases up to 1891. Patrick, in 1896, added 16 more cases as follows: Barkan 2, Jaeffreson 2, Agnew, Moore, Brown, Buzzard, Dujardin-Beaumetz and Abadie, Thompson, Mendel, Oppenheimer, Gowers, Mitchell, Harlan and Patrick one each. I find Harlan's case was monocular and Moore's was more accurately one of hysterical photophobia, which reduces the cases added by Patrick to fourteen. These with the seven of Gilles de la Tourette make twenty-one, to which may be added one by Glasscott, which brings the total to twenty-two in 1896. Since 1896 I find cases reported as follows: Fernandez 5, Bryant 2, Hubbell, Salterain Isola, Roux, Southard, Ramos, Strzeminski, Park, McReynolds, Pfingst, Williams and Bocci one each, or nineteen, which added to the twenty-two cases up to 1896 gives a total of forty-one. There may be a number which I have overlooked, and there certainly have been many not reported.

In reading up the reported cases I am impressed by the great difference in the clinical pictures which they present. It requires an unscientific stretch of the imagination to see in all these cases an identical condition. The effort to make them all conform to one rigid and inflexible conception of hysterical amaurosis must lead to confusion and doubt in the mind of the investigator. The difficulty arises from the fact that so many of our text books and writers try to draw a well-defined line of demarcation between simulated amaurosis and hysterical amaurosis. This difference is sometimes drawn only by inference or omission and yet the sum total of the impression given is that hysterical amaurosis is a thing apart from simulation; that the patient is acquitted when hysteria is convicted. The differentiation which they attempt to force being, as concisely stated by Patrick, that "one sees and does not know it, and the other sees and will not tell it." That this is the difference which exists between some well-defined cases of hysteria and simulation is conceded. The difference between profound hysterical amaurosis and venal simulation is the difference between blindness and sight. Yet to accept as a dictum the statement, that in hysterical amaurosis, the patient sees but does not know it will clearly exclude a number of the above cases reported under that title. Today, as a result of the work of the French school, hysteria is recognized as a disease, but in accepting the definite entity of the condition we must not lose sight of the fact that the hysterical patient still possesses all of his old time capacity for perversity and dissimulation. I believe in some cases of hysterical amaurosis there is a real psychic inhibition, but in others the blindness is simulated. In many of the reported cases there is a profound mental and physical disturbance which may well lead us to believe that the patient does not know he sees. In the rest, the only hypothesis which meets all the symptoms is that the patient sees and knows he sees, but that he is actuated in this foolish simulation by a state of unstable equilibrium, which may be called hysteria.

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*Read before the St. Louis Medical Society, May 18, 1906.

The only way to reconcile the wide difference between the reported cases of hysterical amaurosis is to divide them into two classes. We must recognize that hysteria and simulation may be combined in the same case and that there is a definite clinical picture which may be called *Simulated amaurosis, hysterical in origin;* whereas the more profound condition may be called *True amaurosis, hysterical in origin.* In this attempt to define the two forms of hysterical amaurosis I hope I have not added confusion to the subject of simulation. It must be distinctly understood that there is the widest difference between the power and activity of the will in a simulator with a definite motive and the hysterical simulator whose will is too weak to resist a dominating impression or peevish impulse.

I have examined the text books to find if they recognize hysteria as an etiological factor in simulation, or simulation as a manifestation of hysteria with the following result:

Berry, Carter, Starr in Posey and Wright, Schmidt-Rimpler, Roosa, Tiffany, Gowers, De Schweinitz and Noyes do not mention any relationship between the two conditions. Oliver, Knipe in Ball's Modern Ophthalmology, and Swanzy make very brief mention of any relationship and their words can only be interpreted as a warning against subjecting the hysterical patient to the suspicion of simulation.

May says, "It is sometimes difficult to distinguish between this affection (hysteria) and malingering." Fuchs, in one place says, simulation of blindness may occur in hysterical persons, in another place he says, it is often hard to draw the line between simulation and hysterical blindness, i. e., one having an actual existence in the imagination. Jackson says, "Hysterical amblyopia and simluated amblyopia, although probably not the same thing, are to be detected by the same tests."

I find so few who intimate any dependence of simulation upon hysteria, and their references are so vague and brief that I quote them in full.

Juler says, under simulated amblyopia, "It also occurs among nervous and hysterical young women." Fick says, "Other simulants, particularly hysterical women, have only the impulse to make themselves interesting." The context in Fick and Juler does not enlighten one as to whether they mean this to apply to the milder forms of partial blindness, or whether they mean to include total blindness of both eyes. Nettleship says, "Hysterical amblyopia and amaurosis take various forms and real defect may be mixed up with feigning." Gunn says, "Many forms of hysterical amaurosis have apparently an element of simulation." Baudry says, "Hysterical subjects are seen, who as a result of vexation, through revenge, fancy, etc., declare themselves to have become suddenly and totally blind." Jaeffreson's two cases he admits were simulated amaurosis, but he called them hysterical, because as he says: "The motive which impels a recruit or schoolboy to feign blindness for his own personal advantage, and the aimless mimicry which leads a young woman for months and sometimes for years to simulate blindness, and subject herself to all kinds of severe treatment and disagreeable restrictions have not their origin in the same psychological condition."

The manifestations of hysteria may be divided into the physical and the mental. The physical symptoms or stigmata are numerous and well known; such as anesthesia, hyperesthesia, contraction of the visual fields, reversal of the color fields, the globus hystericus, muscular contraction, paralysis, involvement of the special senses, supra-ovarian pain, loss of pharangeal reflex, etc. A review of the reported cases inclines me to associate a preponderance of the physical symptoms with true hysterical amaurosis. The mental symptoms are probably not as well understood, and in the absence of any physical symptom the hysterical nature of the disease might be overlooked. Yet there are many cases in which the mental symptoms are the only ones present to guide in a correct diagnosis. This, it seems to me, is especially true of the cases of hysterical simulation.

Legrand du Saulle classifies the mental symptoms under four heads. 1st. What might be called nervousness without any alteration of the mental faculties. 2nd. More pronounced nervousness, a state of unstable equilibrium. Impairment of the will power. 3rd. Irresistible impulses, hallucinations, alteration of mental faculties, etc. 4th. Hysterical mania.

Preston classifies the mental symptoms of hysteria into three stages. "First, those slight conditions of hysteria in which the intellectual faculties are not altered, and which are characterized merely by some want of mental co-ordination, by a heightening and want of control over the emotions. As has been said this state would be called, especially in this country, nervousness. Secondly, a condition in which the intellectual faculties are markedly altered, in which hallucinations and even weak delusions are present, and the will power shows all degrees of weakness up to the tottering condition which precedes its final overthrow, which overthrow gives us the third and by far the best marked and most clearly defined condition—hysterical mania."

In elaborating upon the mental instability and capriciousness of the first stage Preston mentions a tendency to uncontrolable fits of anger, a spirit of contradiction and peevishness. Also an overweening egotism and a morbid desire for notoriety. "Intimately connected with this latter characteristic is the well known habit of simulation, and as a consequence of this latter, a disregard of the truth." In describing the second stage he mentions the predilection these unfortunates manifest for fake suicides. My purpose in dwelling upon the mental symptoms will become apparent in the report of the following case:

W. S., age 35; railroad switchman; large size; well proportioned; prepossessing in appearance. On the 15th day of May, 1904, between seven and eight o'clock in the morning, when on his way to his home from work, was instantaneously stricken blind in both eyes. Everything became absolutely black; was not able to distinguish a ray of light though the sun was shining brightly. He was taken to the home of a brother workman, where he remained all day. At five o'clock in the afternoon he was led to St. Mary's Infirmary. The internes at the hospital report that when he came in he was in a state of excitement almost amounting to incoherence. They were not able to detect the odor of alcohol on his breath, nor was there evidence of the use of any drug. I was immediately sent for, but did not respond to the call until the next morning.

When seen, he was sitting in the middle of the room with both eyes unnaturally wide open and the gaze fixed. When spoken to, the eyes remained in the same position with no apparent effort to turn toward the speaker. Pupils were normal and reacted perfectly to light from any part of the field. Reaction to convergence could not be elicited, as he refused to see any object near the face. All efforts to excite the lid reflex by striking at him close to the eyes or by flashing bright light into his eyes, seemed to fail. Hearing, smell, speech, pulse and temperature normal. No hyperæsthesia or anæsthesia. Ophthalmoscopic examination revealed a normal fundus in each eye, and also normal refraction. Patient claimed pain in the occipetal region.

I watched him closely and talked to him for a considerable time, and made up my mind that he was simulating blindness, notwithstanding the fact that I had not been able to prove this by any tests, except the simple method of Schmidt-Rimpler. When asked to look at his own hand he insisted that he could not see it, but made no effort to turn his eyes in that direction. My diagnosis was based largely upon the fact that he protested too much. I found that he was a constant smoker and a large eater, which facts I used in uncovering the simulation. I had him put to bed at once, smoking absolutely prohibited, and a very light diet given. In addition I ordered sodium iodid in water, to be given three times a day. This drug was ordered because I have found no medicine which patients object more seriously to taking than an aqueous solution of sodium iodid.

I had the patient's wife come to my office, and very soon learned from her that she too believed that her husband was simulating. She told me that he had an ungovernable temper.

and manifested a tendency to fly into a violent rage without adequate cause. These fits of rage often passed off as quickly as they came. He had, on two previous occasions, tried to scare the family by fake suicide; in one of these attempts they discovered that he had taken nothing more harmful than an emetic. She also gave me to understand that he was an unconscionable liar; that whenever he could get a listener he was prone to tell the most exaggerated yarns, of which he was always the hero. This history confirmed my opinion that there was an hysterical basis for his simulation.

On the third day after the onset of the trouble, he begged to be allowed to smoke, and said that he was beginning to see a faint light. He complained that the light hurt his eyes and asked for a pair of smoked glasses, which I refused, as I reasoned that he was getting tired of maintaining the steady gaze, and wanted something behind which to hide his eyes. The dose of sodium iodid was increased, and he complained bitterly of its nauseating taste. On the 19th, or four days after he was admitted to the hospital, he insisted upon going home. I allowed his wife to take him on the condition that he be led to my office every day, and with the understanding that the medicine was to be kept up rigidly, and that he was not allowed to smoke under any circumstances.

When he came into the office the next day he claimed that he was beginning to see the outline of objects, and he had on a pair of smoked glasses. I took the glasses in my hand, diverted him by talking quite earnestly, and then held the glasses toward him, down, and to one side. He reached out and took them as naturally as possible. He was not very regular in his attendance at my office, and on the 23rd of May claimed that his vision was very much improved. After this he did not return until June 1st, when his wife reported that he had not been taking the medicine, and had been smoking. I found his vision to be 6/15 and that he could read Snellen 1.25. I gave him a severe lecture, and told him that if he did not heed my instructions I would have him discharged by his employer. To open a way for a speedy recovery I told him if he continued the medicine and stopped smoking, I expected his vision to increase very rapidly. One June 4th, or three days later, he returned, and his vision was 6-7½. On the 13th of June vision was completely restored, amounting to 6-5+ in each eye. Soon after that date he moved to Kansas City, and I have not heard from him since.

This patient had no physical symptoms of hysteria and yet in his mental characteristics as described by his wife, he presented a complete picture of mental hysteria of the second degree according to Preston. I feel sure if you had seen this case you would agree with me that this man saw and knew he saw. I know he was simulating and yet there was no motive of gain in his pretension and no uncomfortable duty to evade. On the contrary, the part he played involved confinement, restrictions and inconvenience, such as few would be willing to subject themselves to. We know simulation is resorted to as a means to excite sympathy or gain notoriety. In this case the circumstances were such as to discourage the patient from expecting much of either. I do not believe a healthy man of 35, clothed in his right mind, would essay this part, which requires histrionic ability of no mean order, for the sake of a little sympathy or notoriety.

The fact that this patient was simulating does not exclude hysteria. The fact that he was simulating without any well defined motive argues in favor of an hysterical state of mind. That he was in an hysterical state of mind does not prove to me that he saw but did not know it. I think that he saw and that his foolish pretension was due to a mental state of unstable equilibrium. His was therefore a case of simulated amaurosis due to hysteria.

A LIFE AND CAREER BLIGHTED BY IGNORED EYESTRAIN.

By George M. Gould, M. D.,
of Philadelphia.

Seventeen years ago a healthy lad of 12 years of age began having frontal headaches. He was going to school at the time. Since then he has had such headaches all the time. They were not sick-headaches, and up to three years ago he has never had any other symptoms of disease, local or systematic. About ten years ago he went into newspaper editorial work, reading proofs, etc., for ten hours, mostly in the night by artificial light, and, besides this, going to school in the afternoons. He has thus put his eyes to excessive labor for the last nine or ten years. There is not one pair of eyes in a hundred able to withstand so severe use as this without producing injury somewhere and somehow. Three years ago the patient's mother noticed—and photographs taken at this time show the fact—that the left eyelid began drooping. At this time he found, while at his work at the desk, that his eyes "began watering," and that his headaches increased. He consulted an oculist of his city, Dr. F., who ordered glasses which the patient could not wear, or did not wear. There was a complete failure to inquire as to causes and conditions, and adequate cure was plainly not attempted. At this time the saving of the man's eyes and profession was plainly possible, but failure was more plainly certain. Dr. B., the "best oculist in the city," was next consulted, but only after a year or more of aggravation of the disease had passed. When shown Dr. F.'s glasses, Dr. B. said they did no harm, and did no good, ordered them left off, and that no glasses at all should be used. His attention was concentrated upon a symptom which had suddenly appeared the day before. This was paralysis of the iris, the pupil being dilated to the extreme width, of course with loss of ability to read. Despite this condition the patient was allowed to go to New York City for four days, on business. Upon his return, Dr. B. said there was "paralysis," and thought, as the man was a smoker, that it was due to tobacco, and the patient was put through the colored-wools tests. This was a false trail and similar negative results were obtained as regards alcohol, the kidney-function, diphtheria, carious teeth, colds, and all the rest. All the rest, except one! No inquiry or examination was made as to refraction, or heterophoria; glasses, he said, were not needed, and it never entered his mind that such paralysis could be due reflexly to eyestrain. That would not be "scientific." Hence the iridoplegia (all that was discovered, for the loss of accommodation was not suspected) must be causeless, and all that remained to do was an equally senseless therapeutics. The paralysis of the pupil had not been caused by a mydriatic, therefore it should be treated by a myotic! The logic is not quite clear, but no matter! The myotic instilled each morning soon reduced the pupil to normal, but by 2 o'clock in the afternoon it had again widened *"ad max."* "Office treatments" were instituted and "electricity" was used in the eye and the spine was "touched up" with the "Vibrator." The physician repeatedly told the patient that he could not understand what caused the paralysis. Tiny pills were also ordered, which the next oculist consulted called "booze-pills." Finally, all "science" having failed, the patient was told to go back to his work at the desk. No glasses were given for the paralyzed accommodation of the left eye, none for either eye in fact, and after four or five weeks of suffering the patient consulted oculist No. 3, Dr. M. This gentleman put the patient through the same questioning, examinations, and tests as regards tobacco, alcohol, venereal diseases, kidneys, etc., and finally concluded that the cause of the trouble was an automobile ride taken the evening before the mydriasis appeared. Strychnin and pilocarpin (which have been continued up to coming to me), were sent for, and although the physician had, as he said, no faith in it, the patient was given electricity. (Will this electricity superstition ever end!) As to eyestrain or the need of glasses there was still absolute silence!

Up to this time all near work had been done with the right eye, but now this eye became "bloodshot," "watery" and "prickly." A visit was made to Dr. M., who did nothing, was not, as he said, at all concerned about such things, and allowed the patient to attend "a banquet" in another city. At the banquet a small glass of wine was taken and two cigars smoked. The patient came home from the banquet with the right pupil dilated just as the left had been! The wine and cigars were charged with the crime, and, having been of such great service in the left eye, pilocarpin and strychnin were again ordered for the right eye! The next day, while walking, the patient happened to close or put his hand over the left eye, when he instantly became violently dizzy, staggered, and fell over on the ground. He did not lose consciousness, but arose at once and closing the right eye continued his walking. He at once noticed that with both eyes open he saw double. Calling immediately upon the oculist, Dr. M. found the right eye very divergent, diplopia was present, objects seemed tilted, etc. Strychnin and electricity were reordered, and a steamed or ground-lens was placed before the right eye to prevent double vision. In the left, +Cyl. 0.25 ax. 180 was ordered, and all in a pair of European eye-glasses, which, like an inverted letter V on the nose, falsely located the axis at about 30° or 40°, in a charmingly scientific and optical manner. "A tonic" was ordered and the strychnin was also kept up for two weeks, but then discontinued, while the tonic was taken for six weeks. Electricity was also applied. But as all this fiddlededee with a disease of unknown origin was naturally without effect, and as the paralysis was most surely of central origin ("the lesion," the patient was told, "was at the base of the brain") the highly logical procedure was instituted of cocainizing the conjunctiva and mechanically pulling the globe about—up, down, in, out, around, reversed, repeated, and *noch einmal!* After two months of these "office treatments" somebody got tired, and "a rest" was ordered. But during this rest, both for patient and doctor, the patient must take an "absorbent," and "potash" ten drops three times a day increased gradually to 78, then decreased to ten, then stopped, left the question why the King of France marched up the hill and then marched down again. Dr. B. had advised the drinking of ale; Dr. M. was as strongly opposed to this, and the patient smiled—towards me, and was obedient to his last physician.

The man was now compelled by his inability to work at his desk to accept the tired-out oculist's advice to give up his desk, and with it a position of trust and power for which he had labored so hard during ten years. He had secured the post just two weeks previously.

At once upon renouncing reading and writing all subjective symptoms, the headache, the "thumping" at the back of the head, etc., lessened, then ceased, and there was a gain in flesh of 15 pounds, although the man is still thin. With the lessened eyestrain the morbid cause ceased to act on the general system and health returned.

But the damage to the eyes could not be undone, at least without any attempt to undo it. The scorn of glasses was shown in the eye-glasses that would make even an "ophthalmometrician" laugh. And the ground glass or steamed lens over the right of course prevented any attempt Nature might make to bring this eye into function once more. To add the acme of the ludicrous, the right eye was so paralyticly divergent that by no method could it get a glimpse at this white wall but saw everything at the temporal side wholly outside the glass. Thus, not only was the diplopia not prevented, but the eye was forced to diverge more than it naturally would have done, in order to satisfy its inevitable desire to see something. To rid herself of the bungling device of man Nature had nothing else to do except to produce or encourage ptosis! And this was actually done! To avoid the false image of the right eye displaced 40° or 50° to one side of the true image, the patient closed the right eye, until now there is a paresis amounting seemingly almost to a paralytic ptosis of the lid. Most noteworthy, however, is this fact: with the left eye closed or shut out of function, and with fixation commanded by the right eye, the right upper lid at once, and by the effort of fixation, is raised as high as any normal person can raise his own right lid. With both eyes open this is absolutely impossible, and the lid cannot be raised sufficiently high to free the pupil with the head erect and the plane of vision horizontal. In the last three months, under Dr. M., there has been no improvement in ability to raise the lid. The paretic droop of the left lid noticed three years ago is not now present and that eye is normal in all respects. The right pupil, when the patient came to me, was dilated about one-half maximum mydriasis, and stabile. Before using a cycloplegic I found that the ciliary muscle was absolutely paralyzed in this eye, and that with Sph. +3.00 D. added to the existing error of refraction there was perfect and most excellent acuteness of vision at 14 inches. Under mydriasis the right pupil widened to the limit, but the cycloplegia revealed no greater hyperopia than the manifest had shown.

With paralyzed accommodation the errors of refraction were found to be:

R.+S. 0.25+ Cyl. 0.62 ax. 180°=20/20+
L.+Cyl. 0.25 ax. 180°=20/20+

The ophthalmoscopic examination demonstrates that the funduses of both eyes are perfectly healthy and normal. This with normal acuteness of vision gives the ignored proof, which Drs. B. and M. had also before them, that tobacco, alcohol, etc., had nothing to do with the disease.

Caused by the monocular vision the patient is canting his head to the left and forward, and this, if uncorrected, will in time produce lateral curvature of the spine, or symptoms which are worse. In nearly every case of severe eyestrain, the influence of dextrocularity is manifest. In this one it is exceptionally so and in a most interesting manner. In the dextromanual the left eye is the one which will naturally be more diseased or which will be first thrown out of function if the right has not an error of refraction, etc., so much greater than the left that this one *must* be chosen for exclusion. In Mr. K.'s case, although the left had only one-fifth of the total ametropia of the right, it was the first chosen for condemnation, and was condemned. The warning was unheeded by the man's physicians, the murderous near-work without correcting lenses was allowed and ordered, and the right, even with its higher astigmatism, being unable to bear the strain, Nature suddenly had to renounce, and dramatically exclude it from function; then commute the sentence of the left and bring it back as the sole agent of the visual function. Thus the right-eyed man was transformed into a left-eyed patient; and patient forever, because, in adult life, tragedy results from such an almost impossible and never perfectly successful education of the inexpert center of vision of the left eye, which must be coordinated with the other dextral centers in the left brain.

Seventeen years ago this boy's cerebral mechanism began crying out in pain from eyestrain. And the peculiarity of the eyes was such that every oculist in the world might have known, the best did know, and all should have known, that a pair of astigmatic lenses would have ended the pain, and would have prevented the tragedy bound to come sooner or later in this boy's life. So widely and well should the crude truth have become spread that every parent should have hurried the headachey child to a competent oculist. Nobody, parent, friend, oculist, or physician, warned or hinted to the doomed lad what was in store for him. He endured his headaches for 14 years while he heroically labored with his astigmatic eyes to gain education and an honorable place in the world. With a few hours' sleep a day the horribly abused eyes were driven to their amazing tasks. Then they themselves gave full warning, but the first oculist was not equal to his duty or opportunity and the pitiful neglect continued for another year or more. A second time the eyes warned and a second oculist was consulted who was an adherent, also, of "the old ophthalmology"; he disbelieved in eyestrain (a priest scoffing at religion, a prophet denying God), and what a farce was his etiology, his diagnosis, and his treatment! The cause was staring him in the face, was looking into his eyes out of the eyes of the patient, begging for a couple of pieces of glass there at his hand and thousands in every optician's store. Electricity, drugs, pills, no glasses, myotics, "Vibrators," continuance of the ruinous eye-work, were the orders, resultless except for evil, which aided the patient in his *descensus averno.* Oculist No. 3 added every possible blunder and incongruity to all the previous blunders and incongruities and unwittingly did all he could to increase the eyestrain and its consequences. When absolute failure to cure was demonstrated came the last order of the helpless,—"Rest! Quit your success, gained at such a cost, and renounce your work and do nothing!"

Apparently that all the horrors of malpractice should not be the lot of one patient, none of the oculists was a tenotomist, and the worst evil did not befall him. In this wilful and brutal ignoring of eyestrain, this reckless disregard by the crude minds of the so-called "leading men," of hundreds of proofs by good physicians, there has been a silly and unscientific failure to recognize the fact that the symptoms this man had are often the results of eyestrain. His paresis of the lid and his sudden paralysis of the iris and ciliary muscle of the left eye were plainly of this reflex nature in Mr. K.'s case. The evidence of dextrocularity, etc., was also manifest in the fact. I have had many such cases. The return to normal of the left was another proof, when the right was necessarily condemned to death. Then Nature, the wise, intelligent, ingenious Mother and preserver and healer, unhelped by the oculists, was forced to the issue, and, to save something, she decreed paralysis of the ciliary, iris, internal rectus, and levator palpebræ muscles of the right eye. In the improvement of the ptosis, and, under conditions, the ability to raise the lid high, and in the preservation of perfect acuteness of vision of this eye, there remained broad hints to the oculist who would correct that plus astigmatism at axis 180° which was the *fons et origo mali.* But the scorners of "eyestrain hobby-riders" do not look at Nature's difficulties or hints, but go at them with foolish electricity, and vibrators, more foolish drugs, the disgrace of mechanical rotation of the eyeball, and the brutality of continued use of the eyes. Nature was working for the man's good as best she could, keeping the morbid reflex away from the eyes for 14 years, then giving warning after warning she could do so no longer. Then she tried one device in order to save the precious right eye. No heeding! Then to keep some vision she shut the right eye off with lamings, paresis, heterophoria, and strabismus. Still these were not incurable if there had been a little bit of help. Instead of help there were added burdens and insults. These heterophorias, strabismuses, ptoses, iridoplegias, etc., are often the warnings of a neglected eyestrain, ingenious devices to keep some vision in the threatened wreck of it all. Most often they are the sole methods Nature has, when the oculist will not help, to retain the acuteness of vision, at least in one eye. The oculist who cares nothing for acuteness of vision, or for binocularity, says, "who would bother about a little astigmatism!"

Is there any hope of saving the right eye? Of giving the man a presentable appearance? Of making him capable of carrying on literary and bread-making work? The doctors have all his money, and that one who will now keep up this patient's hope and effort, and who will himself work long and patiently to bring life and order in the wreckage, must be as careless of reward as he is of the hatred of his fellow "scientists." This patient does not give the physiologic therapeutist much encouragement. He now has his right eye, hopelessly I fear, strabismic, ptosic, and probably ruined. He has been turned into a left-eyed man. His calling and success in life have been murdered, and all because the leaders of the profession do not lead, because they ignore and scorn a fact, "a little astigmatism too small to be considered," which hundreds of men, superior to them in scientific and diagnostic acumen, know, and in thousands of cases have demonstrated, to cause intense disease, sufferings, and blighted careers. It is a professional shame and ignominy that we have not ended all this at least 30 years ago. Will it be ended in another 30 years?

In the first ten days after getting the glasses the patient, with a blinder over the left eye, has been able to walk several miles a day without difficulty or symptoms, except a little aching in the excluded eye. He has also read an hour or two at a time with the right eye alone. The right lid is now almost normally raised, the ptosis having almost entirely disappeared. The pupil is steadily lessening in size. But there is still total paralysis of the right internal rectus. There is no headache, or other subjective symptoms, and the marked return of health is evidenced by a gain of 10 or 11 pounds in bodyweight. For the first three days after getting the glasses he could not eat his meals with the blinder over the left eye, because his hand would carry the food toward his right ear, instead of to his mouth; he also had nausea. Both of these troubles have now disappeared. In reading with the right alone he tires a little in one hour, but after a rest of a minute he can then resume reading and go on as before. Evidently the only difficulty remaining is the paralysis of the internal rectus of the right eye.

A CASE OF CHORIOIDO—RETINAL SCLEROSIS WITH SPONTANEOUS DISLOCATION OF THE LENSES, COMPLETE AND INCOMPLETE.*

By William T. Shoemaker, M. D.,
Philadelphia.

The case here recorded is that of a colored man 37 years old, with negative family and personal history. He is married and has three apparently healthy children. His vision has been poor since childhood; he has never been to school a day in his life, and has never seen fit to consult a physician concerning his eyes, being content to select glasses from time to time, from the stock of the optician.

The underlying pathological conditions are, degeneration, atrophy and sclerosis, affecting the retina, the chorioid, the optic nerve, and the crystalline lens with its suspensory ligament. Both eyes are affected, the right being much less advanced than the left. In O. D. the lens is but partially dislocated and cataractous.

The lenticular opacities are mostly in the posterior cortex and seem to follow closely the physiological lens stars. The interspaces are fairly clear, and the fundus can be imperfectly seen by the indirect method. So far as seen, there are no pigment deposits near the disk, but there is general chorioido-retinal disturbances, with vascular changes far less marked than in O. S. Vision with this eye equals 1/45 uncorrected, and 3/45 corrected with a strong concave lens.

In O. S. the lens in its capsule is free in the floor of the vitreous. The vitreous is otherwise clear, and the appearance of the fundus is a most striking example of degeneration. The vision amounts to the counting of fingers imperfectly when in motion at ¼ m. in the temporal field, and all other functional tests are in harmony with the anatomical conditions.

It is always difficult to classify with certainty a fundus of this kind, without knowing the etiology.

The essential points in this fundus are: Complete or almost complete atrophy of the optic nerve with margins well defined. The vessels are reduced to lines; so small are they, that but few are visible. The reduction seems to be due not to a diminished lumen alone, but to an actual reduction of the vessel in all its parts. The pigment is of all varieties, i. e., retinal pigment, wandering and forming grotesque figures, and pigment gathered in masses, some round and some irregular, in different parts of the retina. Gross formations predominate, and no special arrangement along the vessels is noted. The chorioid is sclerosed and atrophied, the individual vessels are indistinguishable, and the sclera shines through, forming a finely woven mesh of brilliant lines. There are no great patches of absorption exposing the dead white sclera, as seen after acute inflammatory disease of the chorioid.

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*Shown before the Opthalmic Section of the College of Physicians, Philadelphia, April 17, 1906.

Little is known of the changes which take place in the suspensory ligament in these cases, but it may be supposed to fall a victim of the general starvation; to relax, to become attenuated and to fail in its function. It has certainly done so here.

Fundus pictures resembling more or less closely the one under consideration are described under various conditions. For example, chorioido-retinal sclerosis, retinal atrophy with secondary pigmentation, pigmentation of retina secondary to chorioiditis, retinitis pigmentosa, etc. So far as pigment in the retina itself is concerned, Camill Hirsch says it can come from but four sources. 1st—From the pigment layer of the retina; 2nd—from the chorioid; 3rd—from the blood,—hematogenous pigment; and 4th—from iron introduced into the eyeball—siderosis. Chorioidal pigment very seldom finds its way into the retina, and then generally after an injury establishing a direct communication between the two membranes. Hematogenous pigment and siderosis need not be discussed here.

The pigment layer of the retina depends for its normality upon the chorioidal circulation. When this is sufficiently disturbed, the retinal pigment undergoes degeneration with all its consequences. It is not influenced by disturbance in the retinal circulation alone. It would seem therefore that all of these cases of acquired pigment in the retina not due to traumatism, hemorrhage or siderosis should have the double descriptive title of *chorioido retinal.*

The evidence of sclerosis and degeneration in this case are overwhelming, and I think the condition corresponds most closely to chorioido-retinal sclerosis. With regard to so-called retinitis pigmentosa, which is also distinctly degenerative, and sclerotic in its nature, this fundus picture differs in many ways from it in its typical form, a form less often seen than reported. The manifestly poor name of retinitis pigmentosa has now become pretty well discarded, but in using the better term of pigment degeneration or atrophy of the retina, the chorioid is still ignored, and yet probably plays a most important if not an indispensable role in the process.

2031 Chestnut Street.

A NEW CONTRIBUTION TO CONGENITAL PIGMENTATION OF THE CORNEA.*

By A. Kraemer, M. D.,

SAN DIEGO.

Translated by Clarence Loeb, A. M., M. D., St. Louis.

A short time ago[1] I reported a case of congenital pigmentation of the cornea. In that case the pigment lay superficial, and was present in only one eye. In this paper I will describe a case of congenital melanosis of both eyes, affecting the deeper layers of the cornea.

These cases are very rare. Inasmuch as the three cases reported by Kruckenberg are the only ones to be found in other literature, every additional case is full of interest, since the genesis and clinical forms of this anomaly are far from being well understood.

A nervous woman, aet. 63, consulted me last March for failing vision, especially for near work. The cause of this was found to be a bilateral neuritic optic atrophy. The cause of this could not be determined, neither from the history nor from a general examination.

V. R.=5/18+1.25 cyl. ax 10° above and internally V=5/6.

V. L.=5/12+1.10 cyl. ax 10° above and internally V=5/6.

With these glasses, V=5/5 (Snellen).

With proper glasses, patient reads fine print, but in addition to the Ophthalmoscopic changes there is distinct disturbance of the color sense (tests of W. Nagel and Pfulger) as well as concentric contraction of the visual field for white and colors, more than could be ascribed to an existing hyperesthesia retina.

I shall not enter further into the status, except to say that the lady was born in America, has always been well, and has never had anything the matter with her eyes before.

What espeically interests us, however, is the finding on the two corneæ. The eyes are of normal form and without irritation; there is nothing unusual in the form and size of the corneæ, abnormal in their transparency.

When, however, it is examined by oblique illumination, aided by a Hartnacks lens, the right corneæ shows a fine brown pigmentation in the form of a spindle lying directly in front of the middle of the pupil. The spot lies horizontal, in the posterior layers of the corneal tissue.

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* From *Centralblatt fur praktische Augenheilkunde*, May, 1906.

[1] *Centralbl. f. prakt. Augenheilk.*, Feb., 1906. Translated for the April number of the Annals of Ophthalmology.

The borders are slightly irregular, but everywhere distinct, the demarcation being formed by very small pigment granules.

The spindle is broader in the middle and about 2½ times as long as broad. In a dark room, with a pupillary diameter of "5" (Haabs pupillometer) the poles of the spindle coincide with the nasal and temporal pupillary borders. The temporal end of the spindle is more acute, the nasal more obtuse. Below, a very fine pigment granule lies just in front of the middle of the actual border. The finely serrated border seems more densely pigmented than the central part of the spindle.

Internal to this bordering zone, the pigment deposit is very fine and nowhere so thick as in the border, but here, also, a sharp definition shows a kind of gray haze near the fine brown pigment granules.

By transillumination with the magnifying ophthalmoscope, the picture is even more distinct. The fine gray haze disappears and leaves only the pigment granules visible.

Examination with the Zehender-Westien lens shows nothing further.

The epithelium over the pigmentation reflects and is unaltered, resembling that elsewhere with the exception of the above regular astigmatism, there is no corneal curvature anomaly.

Great care was taken to look for remnants of the pupillary membrane, but without result. Neither deposit, pupillary fibres nor the so-called Schuberts lens dust were present. The iris was dark, steel-gray, and its markings were single. The pupil borders were sharp. The anterior chamber and iris showed no departure from the normal.

The left eye shows exactly the same form and position of the anomaly.

It is certain that this pigmentation never disturbed the vision.

We have without doubt a congenital melanosis of both corneæ, lying in their deepest layers.

So far our case has coincided with those of Kruckenberg. We do not intend to put it in the class of these cases, although a glance at the picture of Krückenberg's type shows a fundamental difference.*

Kruckenberg's congenital spindle is a vertical one, while ours is a horizontal one—the first ever described.

*** Wir nehmen auch keinen Anstand sie in die Klasse diser Falle einzureihen weringleich, etc. Should this not read: Keinen abstand or einen Anstand? The passage would then run: We do not refrain from putting it in the class of these cases, although, etc.—Translator.**

Furthermore, the border of the pigment in our case is not such a sharp line as in Kruckenberg's on account of the numerous fine serrations.

As far as the distribution of this pigment is concerned, the center, as already shown, is less pigmented than the periphery, in contrast to Kruckenberg's.

Otherwise, the first glance shows the relationship of this case to the Kruckenberg type. Why my case showed horizontal pigmentation is not easily explainable. But there is likewise no *a priori* reason that it must be vertical. My case shows that the congenital pigment spindle may lie in either of the chief meridians.

Our observations have been too few to permit us to speak with certainty of a typical position of the melanosis, so that I cannot deny that the spindle might have a diagonal direction.

If we accept Kruckenberg's hypothesis that the congenital pigmentation of the cornea is due to diffusion of the pigment from the pupillary membrane, which, as is well known, lies against the posterior surface of the cornea for a certain length of intrauterine life, the genesis of the pigmentation is satisfactorily explained. What the actual cause of the origin of the spindle is a debatable question. The great rarity of its observation proves that the conditions for its origin seldom obtain.

Whether the inbibition of the pigment is favored by close union of the two membranes at a certain spot—this could take place by an early rupture of the mesenchyme in the true cornea and pupillary membrane—or whether it is caused by a slight local irritation after the pupillary membrane has been formed, or, finally, whether the melanosis is due to an interruption of the absorption of the membrana pupillaris, is still an open question.

With the assumption of a firm union of the two membranes, which can take place in any direction, the variable position of the spindle in the cornea can be explained.

It is *a priori* to be expected that this anomaly will also be found among the higher animals.

Search through Bayer's* work showed that up to now such an observation has never been made.

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*Bayer, J., *Tierarztliche Augenheilkunde II Aufl.*, 1906. Vienna and Leipsic.

*Bayer, p. 273 (table XIII, fig. I), describes pigment spots in the surface of the cornea of the horse, which arose, however, from the bulbar conjunctiva lying close to the limbus corneæ.

PROGRESS OF A YEAR.

IN THE RECOGNITION OF EYESTRAIN REFLEXES.

By George M. Gould, M. D.

PHILADELPHIA, PA.

In the last year there has been more progress made in the recognition of the diseases dependent upon eyestrain than in the twenty-five or thirty since Dr. Savage announced the discovery of the cause of sickheadache, and Drs. Thomson and Mitchell demonstrated the dependance of many nervous diseases upon eyestrain. This progress is shown in several things: the multiplication of favoring clinical reports; the vindictiveness of the few opponents of the theory; the turning of many of the silent and ignoring into open opponents; and the outspoken conversion of a great number of general practitioners and specialists. Each class is to be encouraged because each contributes to the all-desirable end: those who have cured patients by the relief of eyestrain should report their cases; the conservative, the dogmatic and bigoted should denounce, and gibe, and slander; the ignorers and pooh-pooers should become serious in their calling and therapeutics; and the doubters should prove their unfaith and their faith. These are the only methods of getting out into the open with this or any other reform, and of bringing to millions of suffering patients this method and this possibility of relief.

Within the year I have received a host of letters from physicians. From a few of these I shall quote sentences or paragraphs, because the printed literature does not give a good or accurate indication of the trend of forming and soon to be expressed opinion. A peculiarity of many letters is that there is a disinclination to be quoted, or a positive request not to quote the names of the writers. In all such cases I respect, of course, the anonymity. It is pitiful, but bears witness to the lengths to which intimidation, conscious or unintended, has gone.

"I am an enthusiastic supporter of your views. I am sorry to say that the doctors here are all more or less familiar with your 'hobby,' but treat it with the same sneering contempt you have mentioned. I have had several arguments already but of course I am not in a position yet to substantiate them with cases. However, I have already taken a girl who was so discouraged she thought she would have to give up school—a girl who had been under the care of the only oculist here for two years—and relieved her of nearly all of her symptoms with: O. D.+0.25 S.+0.25 C. ax. 90°; O. S.+0.50 C. ax 90°. I am picking up experience in refracting and judgment in knowing what glasses to give, but such experience is costly if mistakes are made."

"Professional jealousy is the main reason that the profession does not acknowledge the rule of eye-troubles in causing a vast host of reflex symptoms, but such acknowledgement cannot long be delayed. Who can estimate the suffering that will be banished from the earth when the profession sees the truth of your demonstration!"

"It seems a paradox, but it is true that although there is no profession that has had to take in so many new views, there is also no other so hostile to new views."

"I am very glad to read your articles on eye-strain; keep hammering at the general practitioner; perhaps some time he will understand the reflexes caused by this defect. I, devoting my whole time to internal medicine, have difficulty in compelling most oculists to bear me out in believing that eye-strain can cause so many disturbances. Dr. ——, however, is with us in this fight." [The professor of Materia Medica and Therapeutics in a great University.]

"I have two illustrative cases—one of genuine migrain—which the great neurologist said was such and due to faulty metabolism (*sic*) and autotoxemia (again *sics*); the other a case apparently of idiocy from headaches with epileptoid symptoms, now a useful citizen driving his father's bakery wagon, who before could not construct a sentence of five words, and would not know his way home if ten blocks away."

"I KNOW that you are right in your attitude, because my personal and professional experiences corroborate it. I can recall a score of patients in the last two or three years whom I refused to drug until their eyestrain and what it produced was relieved;—and they needed no drugs, or very little, along with hygienic, dietetic, and other management. I could cite you one man who had been to eight oculists in —— and was nearly insane. I insisted on his going to the ninth; then he was relieved. Had he not been, then he was booked for you. The others had been of his choosing, and I was astounded to know the names of several who pooh-poohed his condition. I wish you much success in your crusade."

"I feel indebted to you for stimulating my enthusiasm in the study of refraction and the correction of refraction errors."

"Just relieved a patient who had subnormal accommodation. Specialists are careless, and do bad work and then complain about opticians. Why don't they improve themselves instead of finding fault with others?"

"I have long been a believer in your ideas of eyestrain and have been in the habit of sending my patients to some specialist friend to have the question of eyestrain removed in all headaches, and such symptoms as you describe."

"It gives me great satisfaction to see that you have the courage of your convictions, in setting forth the truth that has been held down so long. I am unable to find words to express my feelings toward you, how I appreciate the stand you have taken with relation to diseases of the general system which are in many instances produced directly or indirectly by eyestrain."

"Since I saw you I have had some very interesting cases: one a lady cured of "Rose Cold" by correcting a :— O. D. —.75 ax. 165°; O. S.+50⊃—3.25 ax. 170° refractive error. Another case of a boy sent to the hospital with supposed spinal meningitis with 3° left hyperphoria and +.37⊃+.75 ax. 90° in each eye. And another with paroxysmal left supraorbital neuralgia with +.87 ax. 90° in E. E. and 5° left hyperphoria. These cases had been treated by general physicians in vain."

"Those who should have been the wise judges and acceptors of new truth, have as a rule been its rejectors and enemies. It would sometimes seem as though the greatest contributions to medical progress arouse opposition almost according to a law; the opposition is strong in proportion to the greatness of the contribution. There appears to be little opposition to commonplace things. For him who gives the profession something really great—the sandbag*: for him who makes a splint—honor and fame. A splint may be unique and good, but it is not like the discovery of great principles and truths constituting foundation stones for the temple of science."

"Two or three weeks ago I had an interesting head-tilting case, that of a girl, age 16, who has been wearing, from one of the best oculists in Los Angeles, R+sph. 0,50⊃+cyl. 0.25 axis 90°. In spite of this correction her eyes have continually felt as though they were full of sand. When seated in my chair I noticed that she had a little tilt of the head, and with her head tilted the axis of her cylinders would be at 90°, but with her head erect would be at 75. Examination under homatropin and cocaine confirmed the off axis and I have accordingly prescribed for her R.+sph. 0.50⊃+0.37 axis 75°."

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*For Boyleston, introducer of inoculation in Boston, the bomb and the halter, literally. (Mumford. *A Narrative of Medicine in America.*) The mob was instigated by his Boston confreres. To-day you get the same figuratively, if you are not ignored.

"Now in my small work here, I have had several opportunities to demonstrate to my satisfaction that the correction of a refractive error met all the therapeutic indications in a certain class of cases."

"From my experience it would seem that clinicians who disregard or dispute the importance of refractive errors in conditions other than those of conscious disturbance of vision, must have neglected their opportunities for observation, or else are unwilling to give the matter fair consideration."

"It will interest you to know that Mrs. S—— lost her attacks of colic about a week after the prescription of glasses, and they have not yet returned, though she still has occasional headaches. This result is not to be attributed to medicines, as I purposely refrained from prescribing drugs that would interfere with our observations."

"I cannot understand how you can be said to have exaggerated the influence of eyestrain, etc."

"Since, owing to your writings I have recognized that there are other morbid conditions besides simple headaches, due to eyestrain, the number of these cases in my practice has been daily increasing. In all cases where my patients have followed my advice and have consulted an oculist who knew his work and did his duty I have been proved right. The opposition to your views comes from a few older oculists in the hearts of the large cities."

"Having been a great sufferer all my life from uncorrected eyestrain I wonder now how such unmistakable and overwhelming proofs of the correctness of your position is not only rejected, but contemptuously spurned."

"I am a most thorough believer as to the very great influence for harm to the nervous system of uncorrected refractive errors. I have read your articles with the greatest interest and cannot see why so many seem blind to the truth contained in them." [An Oculist.]

"'Neurasthenia' has slipped nicely into the place of 'hysteria,' and satisfies the patient better. It has such a grand sound that it is really quite a pleasure to most women to have the diagnosis so established. Both terms are, in the great majority of cases, simply a cloak for ignorance and a confession of incompetence on the part of the physician. In my experience the nervous system is on the whole the most well-behaved of any portion of the animal economy—the least liable to get out of kelter. This should be so because it is the least protected. Like Jeff Davis all it asks is to be let alone. Of course, it does like good food and enough of it. It does, however, resent outside interference, and does not hesitate to make a fuss when that occurs. The doctor's business is to find out what it is complaining about and to seek diligently until he finds it. I doubt if there is such a thing as a purely functional nervous disease. I have long said that the coming triumphs of modern medicine were in the domain of ophthalmology, and more especially in the line of correction of errors of refraction. This from the point of view of diminution of suffering, solely. What we want now is to turn our efforts in the direction of the *prevention* of the troubles which we now remedy? What is the outlook for that?"

"I have often noticed the close relation between eyestrain and nervous diseases."

"You have properly protested against the bad work and bad results of oculists."

"You are doing pioneer work in one of the most important fields of your specialty." [*A surgeon known all over the world.*]

"I am impressed with the number and force of your facts and arguments and believe your conclusions must embody a large amount of truth though your voice may be as of one crying in the wilderness." [*A pathologist of international fame.*]

"While not an oculist myself, 'I have suffered many things at the hands of many oculists.' At last I see progress toward relief, something I had almost despaired of after such long misuse. I am very much interested in your article for another reason. I have been for some years a Medical Inspector for the Health Department of Manhattan and am at present in charge of a Girls' Grammar School, where I was assigned by special request of Miss Alida S. Williams, and by my own desire. She is greatly interested in the eye-strain question, as well as other points connected with school childrens' hygiene and we take great pleasure in making the work something more than a political job. I can corroborate in every particular your statements, especially the last paragraph, 'From 30 to 50 per cent. of school children have sufficient eyestrain to lower their health, put them behind in their classes, or otherwise abnormalize them mentally or physically.' The physical defects among these children are appalling. It is a great pity that some philanthropist does not give a sum of money, the income to be devoted to the supply of glasses for those children who cannot afford to buy them and who are compelled, if they can raise the money, to submit to the blind prescription writing which requires them to take the prescription to a certain optician designated by the clinic, who, as Miss Williams has discovered, charges more than the glasses could be gotten for at a general optician's with a plain prescription. It is also a pity that a fund is not available for the support and encouragement of physicians who are willing to do this work and who cannot devote sufficient time to it because they cannot live on $1,200, which is the sum per year paid to the inspectors." [*Dr. Floyd B. Ennist, of New York.*]

"You are the first to recognize what I have said is the crux of the whole matter,—the genesis of the myopic eye. I approve most sincerely of all you have said. I have been a close reader of your many articles on eyestrain and its results and I can unqualifiedly endorse all you say about it, and am so much impressed with the truth of your position that I never read an adverse criticism any more for the reason that I know from my experience extending over a period of fifteen years that eyestrain has caused more migraine and other protean forms of headaches and nervousness than any other and in fact all other causes. I feel like I would not dare to report some of the cases and marvelous cures I have had, for fear they would not be believed. I commend you for keeping up the crusade."

"I regard the influence of your work on mine as complementary, rather than revolutionary. It was not in my view subversive in any way, but it certainly filled in a very large gap which would otherwise have damaged my thesis materially." [*Francis Hare, author of "The Food Factor in Disease," 2 Vols.*]

"I have *all* of my nervous patients consult a good ophthalmologist the very first thing before going farther into the diagnosis, and I have been surprised how many of them have some eye troubles, which, when relieved, clears up all their nervous and gastric symptoms and straightens out their 'faulty metabolism,' which is now being used in the place of the word 'neurasthenia,' to cover up our ignorance of the cause of much illness. No wonder people are going after 'strange gods' and taking up with Christian Science, Osteopathy, etc. There are too many '—— fool' specialists and not enough broad guaged men of common sense in our profession who are big enough and honest enough to admit that the trouble with many of their patients is 'out of their line.' Isn't it about time to write up the 'graft' and 'frenzied finance' in the medical profession? Sometimes I get disgusted with the ignorance and dishonesty of many alleged 'great men' in our profession and threaten to abandon medicine and go to farming." [*A neurologist known to the whole American profession.*]

"It is quite remarkable how many cases of the most remote ailments can be traced to eyestrain and my records of such cases are growing daily since my attention to the subject has been attracted by reading your works." [*A general physician.*]

"My best successes in medicine have been accomplished by the aid of your studies. Cases I meet among weavers and loomfixers as well as others are fully as tragic as any you describe occurring among people of literary life; and since my field numbers thousands where yours is represented by tens, for few great men cannot overbalance the mass of hardworking people of the mill-districts, you will admit that my eyes fall upon a worse condition than you have yet pictured. These people are the seed for anarchists and other dangerous sorts of malcontents, and the seed for drug or other manias. And the daily tragedies which I can tell you of, or show you if you will come up to my office, you will scarcely feel able to credit until seeing. Dr. —— has nobly aided these people, buying their glasses as well as treating their ocular defects. You do not know what a fine fellow he is if you do not know just what an immense amount of practically free work he is always doing for my people." [*A general physician.*]

"I might say that I am one who heartily supports not only the reply to Dr. Davis above referred to but most all of the statements I have seen from your pen."

"It would hardly seem that it is necessary to pile line on line and precept on precept in order to make a reluctant world realize that accurate refraction is the first and greatest law in ophthalmology; nor yet to cite case after case as though one's word might be doubted, to demonstrate what may be seen in our offices daily, viz: that most profound disturbances, not only affecting the nutrition of the eye, but as well the central nervous system, have their origin in eyestrain and are cured by its relief. And yet when one reads a recent editorial in the *New York Medical Journal,* in which the writer with an air of complaisant satisfaction denies such a possibility, one feels that the editor is thanking God for his ignorance!—and you feel that he has much to be thankful for. Can such a man as Fisher, or as Dana, honestly believe that this position is justified? Or is it that, having once taken a stand publicly, his pride will not allow him to recede?"

"Mrs. Lucy H., age 38 (looks ten years older), for ten years has had the most intense hemicrania, with paresthesia over entire body, loss of consciousness, vomiting, constipation, attacks one to three a week. Refracted May 18, 1905 V. in O. D. 20/70, in O. S. 20/200; with mydriatic, 15/200 in E. E.;

accepted in O. D.+3.50⊃c. 1.25 ax. 45°=20/30; in O. S. 2.75⊃c.+2.75 ax. 125=20/30. Post mydriatic acceptance O. D.+2.00⊃c.+125 ax. 45°; O. S.+125⊃c.+2.75 ax. 125° Returned November 6th, stating she had *not* had a *single attack since wearing the glasses.*"

"As one of those who feels the importance of this subject of the influence of refractive errors on general health, let me take this opportunity to express my admiration for your uncompromising and unceasing efforts to place the treatment of refractive errors where it should belong."

"Perhaps many have written you of making use of the volumes one and two by placing them in the hands of interested and intelligent patients. I have given away and loaned many copies, especially of volume 1, and wanted you to know that the good tidings are being disseminated in this locality." [*A good oculist.*]

"Your faith in the possibilities of our special work has not once but many times been a source of reinspiration to me in periods of carelessness and discouragement. I only wish you could impart in the same way a training in exactness and method which would enable one to realize more regularly the ideal he has before him."

"Professional men can talk all they please about eyestrain. I know my whole career has been crippled by defective eyes and the various nervous symptoms have left an indelible mark on me. I am very sorry I did not meet Dr. —— before."

"Thank you very much for the volume containing the article on slant writing, etc. You are doing God's service in calling attention to these facts. We put the book at once into the hands of the physician who examines our students."

"* * * A revelation in several important respects. I realize that in a very strong way they reflect a new light upon neurological problems, which must cause a revision of some views." [*A Neurologist.*]

"There are none so much in need of the services of the advanced ophthalmologist as are those that won't see. Let the good work go on!"

"You will be interested to know that I have just heard from a patient who had been suffering from abdominal cramps supposed to indicate appendicitis, who has mixed astigmatism as determined by a local oculist to whom his physician referred him rather than have him remain in Philadelphia, that he has had no pain whatever since he has become accustomed to his glasses and that certain gastric symptoms, such as belching, etc., have also disappeared."

"Eyestrain is the most frequent cause of sick headaches. As I see it, it is the prime in a group of causes; often being solely responsible. Eyestrain affects profoundly the whole body metabolism: so will an aching tooth, or diseased tonsil, or many local mal-happenings. But they all differ from eyestrain in that they come and go while it is constant. And the reoccurrence of the sick headache is determined by the intensity of the strain, its adding a little damage each day, plus the ease with which the physical economy is upset. Eyestrain is the least understood of any part of 'orthopedics,' for is its basis not a deformity? That however is a country doctor's view, although I have had ten years of training in a city hospital. In not 5 per cent of those I sent to the city to be fitted with glasses is the work correctly done. They all return with glasses, but I have to continue to treat the systemic effects of eyestrain."

"I am confident you are right in the position you have taken on the remote effects of eyestrain. In the near future the oculists and medical profession will accept most of your views." [*An oculist.*]

"We all owe you a debt of gratitude for your persistence and temerity in telling the public what eyestrain may do in the causation of reflex nervous disturbances. While many of us have realized the importance of the subject I think the fear of ridicule has restrained a free explanation of our opinion. It is simple enough, eyestrain causes a demand upon the nervous system, which it is unable to meet, and as a result improper nutrition in some other parts of the body. The manifestations of nervous fatigue are infinite, and to ascribe some of these symptoms to eyestrain, without explaining the causation, renders one an easy victim to prejudicial criticism." [*A well-known ophthalmologist.*]

"There must already be a very large number of people who owe comfort, prosperity, and visual efficiency to your vigorous crusade against uncorrected eyestrain."

"I am entirely in sympathy with your ideas and feel that your campaign of education is going to result in great good to humanity. I am especially glad to note that at least a few of our foreign brethren are beginning to appreciate the importance of correcting small errors of refraction."

"As I peruse the work and hear the talk on the part of critics, I feel quite sure that the larger fame and glory that comes from such labor as you have done, will accrue to you in the years to come. Sentimentalism in literature and knowledge must be replaced by realism before the great value of the work you have done will be appreciated."

"—— one of the most important parts of an ophthalmologist's life work. It is truly pleasant to know what one's friends are doing for the good of humanity—and you have done much. I am glad to have your friendship and congratulate you from the bottom of my heart."

"I must say that in all I have read, and from experience, there has been nothing near so convincing as regards the importance of correcting eyestrain as your reasoning on the subject, and I regret very much that I did not get in touch with your writings sooner. Several months ago, there appeared a series of articles from your pen on 'Premature Presbyopia, and I began to investigate, laid aside my 'rules' and my work now shows results. Besides I find it pays to have no rules but to correct each case as I find, and never to ignore low degrees of astigmatism."

"We need such literature in every doctor's home. I have been doing eye-work for twelve years, and I think the general practitioner is living in Mosaic times in regard to eyestrain. Could I get a thousand or more reprints of this article to send every doctor in my vicinity a copy?"

"Circumstances arising which prevented my going to consult you as I planned, I consulted Dr. E. E. Jack of Boston; a mydriatic disclosed a considerable amount of mixed astigmatism; am wearing glasses with great comfort and hopes of permanent relief. I have been a close follower of your writings and am in hearty accord with your teaching. While I realize that I have much to learn yet I am earnestly trying to do good refraction work and your writings have been a great help to me."

"I assure you I appreciate very much the work you have been doing along these lines. I think from time to time you receive the cussing, due to work of an advanced order, and I think no doubt you can stand that part, in consideration of the appreciation of many men who are interested particularly in these subjects." [*An oculist of national reputation.*]

"Your works have been the means of saving many persons from similar life tragedies. If the future oculist reads them before starting his life-work there will be less misery in the world." [*A successful oculist.*]

As to the cause of lateral curvature, the influence of dextrocularity, etc., I could quote perhaps from a hundred letters and personal reports. Several school journals have taken up the reform of desks on the lines suggested, have reproduced my articles, etc. I have had probably a hundred cases in my private practice illustrating the theories set forth in Volume III of these biographic clinics. I include in the present volume an address delivered in New York upon the subject by the orthopedic surgeon, Prof. H. Augustus Wilson. One of the most honored if not the greatest authorities in orthopedics, writes:

"I am becoming much interested in the whole question of school-seating, and I am convinced of the correctness of your theory. I have tested a number of persons as to right-eyedness, always with one result, and the only left-handed person was left-eyed."

"Yesterday I found a typical case of twisted spine from imperfect eyes. Now that I understand I wonder any one is so blind as to overlook such instances. Dr. —— examined the child's eyes, and found one was virtually useless. Let the good work go on!" [*A great teacher.*]

"I was called upon by the Y. M. C. A. to examine the school children between the ages of 12 and 18 years, who wished to try for the various football teams of the Public School League. Now these boys who were candidates for their various school teams, represented as a rule the physically fittest of their schools and also were of a high standard of scholarship. Thirty-five passed through my hands before I had to give up the work. It was with regret that I had to stop then as there were about one hundred and fifty to be examined. These thirty-five were excellently developed and good size for their age and yet *eight* showed lateral curvature. The curvature in most cases to be sure, being of a slight degree—averaging about 1 cm. or so from the median straight line. Six of the eight had a right cervical, with a slight left dorsal compensating curve and two left cervical and right dorsal. Eight out of thirty-five! Will I find the wherefore? I handed my results to my successor, but regret to say he was sceptical and did not follow up the work on the remaining one hundred and fifteen."

Dr. H. L. Brush, of Conneaut Lake, Pa., sends me the following reports of two cases of nocturnal enuresis, cured by spectacles:

"Case I. Beatrice, aet. 6, a well-developed and well-nourished child, of neurotic temperament, however, affected with bed-wetting since infancy. Urine normal, in fact could find no exciting cause. Gave atropia in solution and as long as she took the treatment was relieved but soon as medicine was stopped bed-wetting recurred. One day while she was in my office I noticed her look at some magazine upon my office table and concluded some error in refraction existed. I sent her to a competent optician who found astigmatism present, corrected same with glasses and the enuresis was cured immediately, and for the past 9 months she has been free from bedwetting."

"Case II. Girl age 12, enuresis for past eight years. Headache about twice a week, compelling her to keep in bed during the attack. She having run the gauntlet of all the doctors in the neighborhood, I was doubtful about accepting the case. Upon close examination found her digestion poor, with a tendency toward the so-called uric acid diathesis; urine heavily loaded with uric acid, bowels constipated, appetite almost nil, in fact malnutrition seemed the prominent feature. The bedwetting, however, being of so long-standing and antedating the other conditions I believed the exciting cause of that was the key-note to the whole situation. Accordingly I sent her to an optician who found a very pronounced degree of astigmatism present and corrected the same. Improvement began at once and today is perfectly healthy. Enuresis disappeared five days after glasses were secured. Has gained in past four months 20 pounds and is perfectly well."

As regards private letters, anonymous or signed, filled with personal and ridiculous malevolence, they do not count. It is a lost cause that employes such methods of—dying.

I may not now even list the articles, references to books, and monographs which during the year have shown the changed attitude of the profession, even of some of the "leaders" upon this question. The literature is there for any interested observer. The revolution indeed has come with the new trend in pathology, which at last, with a sigh of, *we can no further*, is turning its attention to the unaccountably neglected pathology of functional diseases. So far as pertains to medicine the most noteworthy characteristic of the St. Louis Congress of Arts and Science was a remarkable unanimity of resolve to attack the pathology of functional diseases. For many years there has been a growing conviction that the work of pathologic anatomy has been yielding less and less valuable results in the prevention and treatment of disease. Its duty has been done and its function has long been practically at an end. All the time the great makers of organic disease, the breeders of the morbid results shown in a million slides, made from dead tissues, have been neglected, almost scornfully ignored. All the time the pathologic anatomist seemed to be indifferent to the habits and conditions, the morbid functions which began long ago in each organism, and which finally produced the diseased condition, recognized as anatomic. The preparation of the soil was forgotten in the supposedly more important question of the seed. That physicians should so far forget the clinical side of their work, symptomatology and morbid physiology, is to be regretted. The dead tissue appeared more interesting than the living, anatomic pathology more instructing than morbid physiology, the end-products of disease than the causes that produced them. Disordered and unhealthy function, even in the anatomically demonstrable diseases must prepare the way and begin the changes, must at least make the soil for the terminal diseases. It is plain if we are to prevent these end-results we can do so only by attention to the morbid function. The materialism of many investigators possibly had much to do with the overlong absorption in anatomic pathology, as iteration and reiteration was tireless that there are no purely functional diseases. Now that there is a hastening return from such nonsense to saner views, it is seen that the greater part of the diseases which afflict us, those that are the heaviest to bear, and the most painful, are precisely those most clearly functional, and which no microscope or stain can detect. What to the anatomic pathologist are fatigue, anorexia, headache, migraine, epilepsy, monomania, melancholia, insomnia, diarrhea, constipation, nausea, dyspepsia biliousness, seasickness, and dozens of other diseases or symptoms? Every physician should "read, ponder and inwardly digest" the splendid articles of Meltzer and Sedgwick.

It is therefore with especialy gratification that one finds one of America's greatest clinicians in general medicine, in an address before the New York Academy of Medicine on gastric disorders so long ago as May, 1894, urging these profound truths:

"In the first place, let it be said that the functional gastric disorder is very rarely a primary trouble. In reviewing the records of a series, including between five and six hundred cases of supposed stomach-disease, in which at least one complete examination of the stomach contents was made, in not one instance can it be said that functional trouble indubitably arose from a disturbance that was primarily gastric. The belief should be stated that a long-continued functional perversion leads invariably to structural change.

"The causes of functional gastric disorders are usually some reflex irritation or some toxemia. Your distinguished fellow, Dr. Max Einhorn, in 1893, first described, under the title 'Achylia Gastrica,' a most important condition of the stomach, that was later described by Dr. Allen Jones as 'Gastric Anacidity.' Now, of the cases reported by the latter, together with several others included in the above-mentioned series, the majority has been examined as to the existence of eyestrain. Without a single exception in the cases thus investigated there has been found to exist a definite, and relatively speaking, uniform ocular defect, viz.: unsymmetrical astigmatism of high degree, varying from one to five diopters." [Chas. G. Stockton.]

It took eleven years before the President of the American Medical Association, a general diagnostician of the greatest eminence, the professor of medicine in a great university, to reach this clean brave pronouncement concerning "nongastric organic diseases presenting gastric symptoms": *The Eyes. —The subject is familiar to all. Who has not seen correction of errors of refraction relieve so-called "bilious attacks," periodical vomiting, anorexia, indigestion, and other gastric symptoms? The cure of grave organic ocular defects relieves similar gastric conditions.* Ten or twenty years or more may be required for such admissions as this of Dr. Musser to get into the textbooks, but soon or late they must now be admitted. Most hopeful is the remarkable allusion of Governor Guild in his inaugural address:

"A child may be a dullard at school and a failure in life because of undiscovered defects in eye-sight or hearing. There are, to quote one line of work only, children now struggling for education through pain, ailing little creatures, backward in their lessons, tortured with racking headaches, who only need relief of a complaining set of nerves by a pair of properly adjusted glasses to transform them to healthy, happy children, capable of assimilating all the benefits of their school work."

Dr. Walton (*Boston M. and S. Jour.*, June 22, 1905) studied migraine and the blind, and concluded that, "while other factors than eyestrain may act as exciting causes of migraine and migranoid headaches, still eyestrain is one of the most, if not the most, important of these exciting causes and steps for its relief are imperative."

In the Journal of the American Medical Association of December 2, 1905, there is an article by John Punton, M. D., which shows the beginning of the perception of the true nature and origin of insanity. The writer says:

"It is now a well-established scientific fact that neurasthenia, hysteria and allied states are simply the fore-runners of actual insanity. Indeed, in the vast majority of instances such neurotic conditions constitute its earliest or incipient stage. Moreover, all authorities agree that incipient insanity is attended with physical and mental changes that are indicative of nervous exhaustion or nutritional defects which thus form its physical basis.

"Increasing knowledge of the etiology and pathology of these psychoneuroses also emphasize the intimate relation existing between them besides endorsing the significant fact that insanity is but a different phase and further development of the same morbid process which underlies their protean clinical manifestations. Independently, therefore, of the purely physical phenomena that attend such morbid states, the psychopathic or mental symptoms demand our most earnest consideration, for on these hinge not only the diagnosis, but also the prognosis and treatment."

But why wait for the incurable stages of the disease? And why not recognize, as every careful and observant oculist knows, that eyestrain very often produces these preliminary psychopathic states? Insanity is increasing in all civilized countries and almost exactly in proportion to the degree of civilization. There are over 33,000 insane persons in one state alone of the United States. It is time that the taxpayers should ask the medical profession, and especially the oculists to do what they can to check the morbid increase and unnecessary expense of the burden.

"As a causative factor in the production of headache, eyestrain is most important. Anorexia, dyspepsia, constipation, heartburn, nausea, and repeated attacks of vomiting, represent some of the gastric reflexes. Amenorrhea and dysmenorrhea are menstrual anomalies sometimes caused by eyestrain. Insomnia, nightmare, chorea, nocturnal enuresis and even epileptoform seizures have owed their existence and perpetuation to uncorrected eyestrain in some form. The multiformity of the effects of eyestrain can be thoroughly realized only when it is understood how vital the function of vision is to every act, emotion, and thought. The visual apparatus is in the closest connection with the other higher nervous mechanisms, and the slightest disturbance of the visual portion may produce irritation in the entire motor, sensory, and psychic systems. Happily, the manifold effects of eyestrain, so long ignored, are now being appreciated and recognized." [Cohen's *System of Physiologic Therapeutics,* Vol. VII., p. 367.]

"The medical profession and its patients owe to a physician of Philadelphia —Weir Mitchell—the recognition of the part played by eyestrain in causing or aggravating many nervous and other disorders. They are further indebted to Wm. Thomson, Wm. F. Norris, and other ophthalmologists of Philadelphia for the development of Mitchell's discoveries; in especial to George M. Gould for clear perception of the important place of ocular disturbances in medical diagnosis, and the reiterated teaching needed to make this knowledge an integral part of the general professional consciousness. It seems appropriate, therefore, that a treatise like the present, emanating from Philadelphia, should give the subject its deserved prominence, probably for the first time in general therapeutic literature." [Cohen's Preface to *A System of Physiologic Therapeutics,* Vol. VII.]

Important, exceptionally important, because the American Ophthalmological Society has never in all its history heard or allowed any such an admission, are the following words by Dr. Randall of Philadelphia, at the 1905 meeting:

"If I know anything in ophthalmology it is the occurrence of anatomical lesions of the eye, in the retina, choroid and other portions, as well as various reflex neuroses, as a result of eyestrain. * * * I have seen epilepsy mitigated so much that the sufferers practically ceased to have attacks. As to the production of choroidal irritation * * * such conditions frequently arise from eyestrain."

The director of physical training of the New York Public Schools, Dr. Gulick, says [*N. Y. Med. Record,* July 28, 1906]:

"Vision.—However perfectly the school building may be ventilated, with what degree of perfection light may be regulated and admitted, temperature controlled, humidity adjusted, the desk perfectly fitted to the individual, periods of sitting still shortened, and periods of varied bodily and manual activity lengthened—the central difficulty of school life remains. It is a difficulty which is dependent upon the fact that the treasures of civilization are stored in print—in minute black marks upon a white surface, which must be held relatively close to the eyes. This involves a conscious attention and strain of the ocular apparatus to which it was not adapted during the long ages when it was being developed. Even under the most favorable conditions, the strain of civilization rests most heavily upon the child with reference not merely to the eye, but also to the nerve centers back of the eyes, and to that very great symptom-complex which is associated, as we have only recently discovered, with eyestrain.

"Examinations made in many cities and those made in New York under the direction of the Board of Health, have satisfied us that not less than 30 per cent of all children in our elementary schools are suffering from ocular defects demanding correction, and not less than 17 per cent have ocular defects so severe as to be a serious menace to their progress. These defects acquire their significance, not because they are defects merely, but because they are defects of that portion of the human organism upon which learning and education largely rest. The relation of this condition to school work is shown by the fact that ocular defects are in direct ratio to the length of time the pupil has attended school. This is the point of strain, this is the point that demands more aggressive and constant safeguarding than any other of the systems of apparatus that we each possess."

According to the last report of the London County Council it was found that in 61,676 children examined one-third fell below the standard in visual acuity. This was of course with crude nonmydriatic examinations, and as most all American oculists know, those having fair acuity but severe eyestrain outnumber the others, and it is precisely these that need glasses the most to protect the general system from reflex diseases. Despite this the oculists of the London schools say:

"It is commonly supposed that almost every child with defective acuity require glasses, but there could be no greater mistake; some can get no improvement from glasses, some will do better without glasses, a very small number are found with defective visual acuity and no refractive error, and in the course of one or two years ultimately attain normal vision. Viewed from a wide public health point of view, it ought not to be necessary for a considerable percentage of children to wear glasses. The rational treatment of most of these children should be an educational modification which avoids the necessity of glasses."

There could not be greater error born of superabundant stupidity than is exhibited in this preposterous nonsense. It is the voice of the middle ages, the gibbering, as Macaulay would have said, of the ghosts of the dead sitting on their own graves. The profession has always been opposed to glasses until recent years, and the work was relegated to opticians until about fifty years ago. The Paris College of Physicians excluded from membership those whose work was the selecting of spectacles. Down to the middle of the last century physicians advised against the correction of optical defects, and ascribed eye-diseases to the use of glasses. There are a number of famous American oculists who today carry on the same superstition, and boast that they "cure patients by taking glasses off." They are those, of course, who know nothing of refraction, and who jeer at the New Ophthalmology. If they could prescribe correct lenses they would be believers in right glasses, because they would cure their patients. If taking off incorrect lenses cures, then logically lenses have power for evil; and if they can harm, they may therefore be made to help. But when these bunglers are compelled to prescribe glasses, the patient and the next oculist consulted should remove them speedily!

All this "conservatism," ignoring, opposition, and bickering, as regards the New Ophthalmology has a profound and startling relation to quack ophthalmology. The newspapers all contain advertisements of travelings opticians, and oculists with and without the M. D. degree; "optometric specialists," and "optical schools," are multiplying all over the land. What are we going to do about it? We will do nothing, and we can do nothing. As a profession, both general medical, and specialist ophthalmologic, we are as busy creating these quakeries as we can possibly be. The people are learning and the optician-refractionists are learning the frequent dependence of headaches and a hundred systemic reflexes upon eyestrain. They can often refract as accurately, more accurately, some of them, than the regular city oculist who does his work in the way the jeerers at the New Ophthalmology do their work. But the ignored and terrible truth remains, as the best opticians and their journals contend, that, few even in the cities can get expert work done (not by the hospitals and dispensaries, Heaven help us!) and over 60 per cent of people needing scientific refraction can not visit the cities or pay the expert's fees. In one city by a careful inquiry I found that twelve of the principal oculists charged regularly on the average $24.00 per patient for their work of refracting and for prescribing glasses. Add the traveling expenses and the cost of spectacles, and it is readily seen why the vast majority of people of the country, of the villages, and of small cities must turn to the optician and jeweler, the traveling quack, or the horde of deplorable wretches who peddle spectacles, in places hundreds of miles from a reputable oculist. If the patient were minded to seek the city man's advice the chances are that he would fall into the hands of "the leading oculist" who refracts by machinery, without a mydriatic, and with the prejudice and "science" of the oculists of the London County Council.

The chief supporters of such prejudices and such "science" are the commercial medical journals. They miss no chance to sneer at refraction specialists, to accept and print all worthless stuff offered against the eyestrain theory, and "extremist." I have long been watching the antics of the editor of one such journal; once in a while he unwarily accepts, or is forced to accept, an article on the other side. His efforts to get rid of it, to keep up an appearance of decency to contributors, are amusing. When he cannot do anything else he tries to wear out the patience of the author by holding his article in type and unpublished for several months or a year.

One reviewer says that the rejection and ignoring of all medical discoveries is due to justifiable conservatism instead of to skepticism—an execrable misapplication of terms, and a worse excusing of brutal neglect of patients. The "conservative" is usually one who openly pretends to conserve truth; he aims secretly to conserve himself; he always ends by conserving error. This reviewer's saying wholly ignores the millions who have been allowed to suffer and die because the leaders and judges led the old error and judged wrongly of the new truth. For thirty or forty years one-third of our people and patients have been denied the relief and health that was their due, while Drs. Roosa, Davis, Dana, Fisher, Knapp, Howe and others have publicly refused to allow it, and thousands of others have been intimidated into the same hideous error. This should not be an affair of prejudice, of professional reputation, of "science," of "extremism," but simply one of testing, of fact, of desire to give every patient every chance to get relief. An earnest wish to benfit the patient would any time in thirty years have brought health out of tragedy for millions of our patients. "Dangerous to try a pair of glasses?" A true physician would have found it "dangerous" *not* to try them! The cruelty of it all is amazing, for it is equally cruel whether either horn of the dilemma is chosen; if it is due to prejudice it is a crime because a scientific man has no right to be prejudiced; if it is due to stupidity it is "a blunder worse than crime."

For, as I have said,* that a vast majority of all cases of headaches—certainly nine-tenths—are due to eyestrain is a truth beyond question with all who have had experience and who know. That with headache, and often without it, a large indefinite proportion of digestional, nervous, and psychic disease is due to the same cause is quite as true. A few cases may be due to malfunction or organic disease of other organs, but it is not known in how many of these cases eyestrain is the primary cause of these extraocular diseases; it is also unknown in how many the eyestrain may be the direct and contributing cause of the headache ascribed to the extraocular disease. In thirty-one years the members of the American Ophthalmological Society have contributed three papers suggesting that eyestrain is the cause of some headache, and one member has contended that nasal disease, not eyestrain, is the cause of frontal headache. But there have been 122 papers on ocular tumors and many hundreds on ophthalmic surgical subjects. Medical opinion in continental Europe has never heard

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***Section on the Practice of Medicine, American Medical Association, Boston, June 8. 1906.**

of eyestrain as a cause of anything, much less of extraocular disease, and in England professional pandiculation is confined to a very few "extremists," the mass still dreamlessly sleeping as sweetly as their Continental brethren. In our country the testimony as to the role of eyestrain in producing headache is positively overwhelming, but the great body of our medical men are still begging for "just a little more sleep, a little slumber, a little folding of the hands to sleep." As to the ocular origin of much neurasthenia, gastric disease, general ill-health, suicide, etc., we have only got as far as nightmare.

What are the results of this professional narcotism? These:

1. The country practitioners, and some of the silent modest general physicians of the cities are awake to the possible ocular origin of these headaches, etc., but the so-called leaders, the writers of text-books, the members of the professorial class,—all these except one or two are wholly indifferent to the matter. The text-book of Allbutt is described as the best on general medicine in the world. It contains not a word upon the subject of the ocular origin of headache, or the ocular origin of any other disease, not even the psychic disease of text-book makers.

2. The general medical profession of America is a hundred times more conscious and acknowledging in the matter than the oculists. It is of course beneath the dignity of most neurologists to care about the cause or the cure of any disease. While the Governor of Massachusetts in his inaugural address says that untold numbers of children are becoming ruined in health because of eyestrain, leading members of great ophthalmic societies ridicule such folly. While one great diagnostician says that all sorts of gastric diseases, as are "familiar to all," are often due to eyestrain and cured by glasses, all the stomach specialists in the world, and 99/100 of the oculists in the world deny the truth. While a great New York surgeon says he refers a large proportion of his patients threatened with abdominal operation to the oculist, who cures them brilliantly, the entire ophthalmic profession smiles inaudibly at this supposed "extremism." While the best orthopedic surgeon in Philadelphia publicly states that a large proportion of cases of lateral curvature of the spine are due to eyestrain and ocular function, ophthalmologists are silent, or sorrowfully groan and squirm. While medical journals are teeming with reports of the world's greatest scientist as to the sleeping sickness in Africa the appalling sleeping sickness at home does not at all interest. While from 40 to 60 per cent. of school children, by actual examination, are suffering from the systemic effects

of eyestrain, and while great school teachers are trying to get the oculists to stop it, famous ophthalmic specialists are pretending to refract without a mydriatic and with the ophthalmometer alone, and of course the spectacles they prescribe are ludicrous blunders; consequently their pet amusement is to guy the "eyestrain faddist." The professor of medicine in a great university medical school writes me that, excepting one, he cannot make the oculists of his neighborhood believe in the eyestrain origin of diseases demonstrably due to eyestrain

Now, gentlemen, I could enumerate things of these kinds for an hour, but as my five minutes are closing, I wish to ask you the reason for such a topsy-turvey world. Why are we caught in such a set of contradictions and absurdities?

The answers are many, but there is only one that can be emphasized here: It is absolutely decisive: As general practitioners you desire to cure your patients. You are not, most of you at least, professors, mixed up with, and your personalities enslaved by college rivalries, hospital cliques, and personal ambitions. You don't care a button, for conservatives or extremists, but you desire first of all the truth, the knowledge of the causes and the cure of diseases. The single explanation of all this wrangling and misunderstanding, is that refraction is not a science; your refraction work is not well done. If the experiment could be rightly carried out, of ten or of fifty different prescriptions for the eyestrain of one and the same patient, by as many different oculists of different cities, even in America, no two would probably agree. The test of the eyestrain theory has never been made; no attempt at it has been made. There is no uniformity of teaching as to the science and art of refraction. If our car axles, dynamos, watches, engine valves, and thousands of instruments of precision were made with the lack of precision customary in the diagnosis of refraction errors by the oculists of the world, our civilization would come to smash in 24 hours. If the truth of the eyestrain theorists is to be tested, there is only one pair of lenses which can cure a certain patient. There is not a serious and adequate school of refraction in the world, not an attempt to establish such a school. Until you establish such a school the most of your attempts to cure your patients of headaches, neurasthenia, disordered nutrition, functional gastrict, intestinal, and abdominal diseases, many nervous and mental diseases, etc., will generally end in failure.

Moreover listen to this:

Wilson of Montrose Pa. (in the *Journal of the American*

Medical Association of May 19, 1906), thus hits his finger upon this ailing place:

"It is a fact that nearly all of the headaches just above and back of the eyes are caused by defective vision and that large numbers of school children go to their physicians and are given headache remedies without end. This is to no purpose, and they finally have to give up school on account of becoming nervous wrecks, unless by chance they happen into some jewelry store and are given some kind of lenses to wear which may relieve the trouble to some extent. The country physician, therefore, should take up refraction work. The great mass of working people simply can not pay the fee demanded by the oculists and are forced to put up with the indifferent work of the so-called opticians. Two or three hundred dollars will buy the necessary equipment and a month's work in some eye infirmary will give one a start, and one can do as well at once as any optician will ever be able to do."

As a profession and as specialists we have not raised one finger to prevent or to undo the deep disgrace hinted in these lines. There is not a single adequate, serious, school of refraction in the world, nor is there a sign that one is coming. Yet such a school is more needed than all the ophthalmic departments in all the medical colleges and hospitals of the world. If there are a few careful and skilful refractionists in the United States who might agree in their diagnosis of one case, there are 5,000 who would disagree, disagree root and branch. There are whole states and territories, whole sections, in which no poor person can possibly get such medical service.

Moreover, there are at the least fifteen millions of American children and adults afflicted with lateral curvature of the spine. All the smiles of incredulity will not, alas, lessen the number, nor the horror of the consequences of the abnormalism. There is no existing machinery, no care or solicitude to prevent the sufferings, none to prevent the very existence of these millions of scoliotics. The defect arises unknown and unsuspected by physicians and by orthopedists; when it is incurable the orthopedist learns of a few of the cases. Surely over 90 per cent. of these scoliotics owe their tragedies to ocular function and malfunction, readily demonstrable, and its results always preventible. Two months ago, for example, a child of five years of age was brought to me with many complaints, vomiting of food, peevishness, ill-health generally; a nurse and a physician were retained as constant attendants of the child. I found a grade of astigmatism so low that great authorities publicly to the profession and daily to their patients, state that it is useless to correct. Both axes of this astigmatism were 105°, a defect that produces head-tilting and spinal curvature. The child had both. Glasses were applied, and since then the head-tilting and the incipient spinal curve have disappeared, there is no vomiting, no drugs are now required, there is steady gain of weight, there is complete return to normal health. What would have been the life history of this little one had it fallen into the hands of the "ophthalmic surgeon" who scorns the refractionist; who sneers at functional and beginning disease; who does his refraction with the ophthalmoscope, and without a mydriatic; who loves surgery fifty or five hundred times as much as he does the prevention of disease; who loves surgery five million times as much as he loves the prevention of surgery; who is forty or one hundred times more interested in a sarcoma or an osteoma, or a coloboma, than in the headache and vomiting, and "neurasthenias," and suicides of his patients? Physiologic pathology, not the outworn and senile anatomic variety; attention to functional rather than organic disease; clinical rather than laboratory investigation; common sense rather than ultra-scientific medicine; prevention of disease as well as the cure of it,—such will be the watchwords of the future. The patients' interests are first to be conserved rather than the success or ambition of the physician, and decidedly before those of the profession. A little knowledge of biology would have spared the profession the shame of the last thirty years as regards eyestrain. The eye is the mechanism to guide locomotion. *Ubi motus, ibi visus.* It is the prerequisite of every act. If inexact it becomes pathology, and most all our civilized vision is pathologic; thus inaccurate and morbid vision may and does produce, directly or indirectly, any of the diseases of civilization.

At present we oculists are most busy and earnest, and effectively so, in creating "fake" Ophthalmic and Refraction Schools, refracting opticians, peripatetic spectacle peddlers and quack M. D. oculists. These things are the direct result of our neglect, our bigotry, our money-making, and our pseudoscience. No blame of course to them who make their chief corner stone the block we have rejected. At present osteopathy is influencing legislatures, and ignorantly, but far more successfully than many of the profession, it is treating the millions of distorted or weakened and diseased backs and bodies of our people; we neglect the study of the spinal column utterly and wholly in the functional and beginning stages of lateral curvature. Osteopathy is a product of our professional neglect and bigotry, and especially of the ophthalmic variety.

Great surgeons and orthopedists say, if a child does come into their hands with lateral curvature,—"O, let it go; give it some exercises; it will get well as it grows older." If they pretend to treat it at all, they give it over to a nurse to handle. In truth they do not treat it until they can treat it surgically; and there was never a case of organic lateral curvature cured, either surgically, or by all the horrible torture chamber machines a Hoffa could devise or picture. Not a man knows the cause of this defect, and how, therefore, can there be a cure? The superintendent of school of New York City orders his hundreds of thousands to carry their books upon one side one-half the time, and on the other side the other half. In this same city great classes of poor children are formed in lines and taught to bend their bodies at command to one side, and then to the other. Better would it be to hold a black cat over the cross-roads at midnight and mumble a charm! Osteopathy is a wretched thing, but it often cures and, however, blindly and stupidly, it is making some sort of use of deep massage, the stone which the medical architects refused.

Eddyism is rampant in the land and professionally we are responsible for Mrs. Eddy and her foolish children. We have, as medical men, wholly neglected the attitude of mind of the patient to himself, and to his disease. Especially to *her* disease! We have been so absorbed in our so-called "science," our professional dignity, our personal reputation and success that we have forgotten the first duty of any human being,—the duty to be kind, and to take a personal interest in each other as individuals, especially if they are our patients. The second duty we also forgot, to be sincere, to believe in ourselves and our therapeutics.

With all the follies of faith-cure and of unchristian unscience, the Eddyistic sillies did not forget those two fundamental duties. Again they made use of our refused quarryings as corner-stones of their healing temples. It is ridiculous bigotry to make fun of the quacks we ourselves allow or create. These quackeries are not made entirely of follies, and greeds, and stupidities. And our medical practices, "scientific" and "ethical" as we fondly imagine them to be, are not without elements and alloys of quackery, folly and greed. The more conservative, the more "scientific," the more self-satisfied, the greater, usually, is the alloy of quackery. Especially in the cites; especially among the leaders, the professors, the text-book makers;

especially among the specialists. The hope of progressive and helpful medicine lies in the country practitioners, the modest unknowns of the cities, the protestants and extremists. Anything, even earthquakes—are needed to shatter the complacency of the success-hunters and of the success-getters. Every text-book, monograph, and medical journal article will be revolutionized when the occulists agree; they will not agree until you as general practitioners secure the establishment at least of one serious refraction school, with a two-year, or a three-year obligatory course of post-graduate study. And this as general physicians is your concern. You will be compelled at last to force us to do our long-neglected duty.

ON THE CENTER OF MOTION AND THE ANGLE ALPHA.

By Dr. Lucien Howe, Buffalo.

From the First Volume of "The Muscles of the Eye," now in Press by G. P. Putnam's Sons, New York.

Calculation of the Center of Motion by Means of the Javal-Schiotz Opthalmometer.

It might be sufficient, after referring briefly thus to the method adopted and the results obtained, to leave the subject here. But some students may care to follow it a step further, making the measurements themselves, and for that reason an additional word is in order, to indicate how the center of motion can be determined by means of Javal-Schiotz ophthalmometer now so commonly used, at least in America.

For this purpose, it is necessary to place the instrument on a table about a meter and a half or three-quarters in length, and draw the telescope backward from the head-rest until the distance between them measures 1.33 meters. Of course the mires are dispensed with altogether. A small electric light or a candle is placed directly above or below the tube, but in order to focus the cornea, the optical arrangement requires that the tube should be proportionately shortened. One conjugate distance—from patient to instrument—having been lengthened, the other conjugate distance—from instrument to observer—must be shortened.

The easiest way to accomplish this is to unscrew the tube at the point where the larger portion of it joins with the smaller—that is, take out what may be called the slim joint.

It is necessary, therefore, to place a proper eye-piece at the end, in order to see the double image of the cornea distinctly. For this purpose a twenty-diopter glass, or the ordinary eyepiece of the ophthalmometer, can be used, by having a collar fitted to it of sufficient size to adapt it to the larger part of the tube. Such an arrangement gives a clear double image of the cornea, or by changing the distance of the instrument from the patient the two circles of the cornea can be made to overlap each other to any extent desired.

The second modification of the ophthalmometer necessary for this purpose is to attach to it a bar on which to record the amount which the globe turns from one side to the other. For this, we place a small brass bar, which measures about seventy centimeters long by five or six millimeters square, horizontally across the center of the instrument. It happens that the earlier forms of the Javal-Schiotz ophthalmometer have a horizontal slit in the disc, and it is therefore easy to attach the bar by means of a couple of tumb-screws. The rod should be graduated in centimeters from its central point outward in each direction for a distance of about twenty centimeters, and from that point, to its end, in millimeters.

On this bar are two small carriers which slide on the bar at will and serve as objects at which the patient looks. In order to make these more distinct, it is sometimes desirable to attach to each one a bit of paper or other object easily distinguishable.

The third change in the ophthalmometer is to attach to the part against which the head rests, a ring or square which has a hair strung vertically across it, and so arranged that it can be brought close to the cornea under examination. The vertical hair in the ring should also be so near to the cornea that both hair and cornea are focused at the same time, and so adjusted by a slide that the ring can be moved slightly from side to side until it is just opposite the center or edge of the cornea. Having made these three alterations the procedure is simple. First, we must measure the diameter of the cornea. To do this the distance between the instrument and the observed eye is increased until the doubling of the image is such that the edge of the one cornea passes through the center of the image of the other cornea (Fig. 95). The distance from the center of the prisms to the center of the cornea is then measured. This distance, D E, we will call *a* (see Fig. 97).

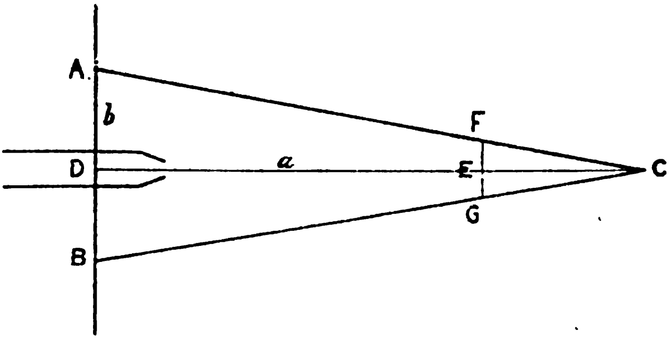

FIG. 97.—Triangle on which calculations are based to determine the center of motion of the globe.

Half of the breadth of the cornea is found in the following manner: measurements show that the ophthalmometer used is so constructed that when an object is placed 330 mm. from the center of the prism the instrument produces a deviation of 2.95 mm. of the image of the object. Hence if the cornea is placed at a distance, *a*, and is deflected a distance equal to its own half breadth, *x*, we have the following proportion:

$$330 : 2.95 :: a : x$$

$$\text{and } x = \frac{2.95\,a}{330} \qquad (1)$$

In order to measure the center of motion the patient is requested to fix his eyes on one of the small carriers of the bar, which is placed directly over the center of the instrument; the hair is then adjusted until, on looking through the ophthalmometer, it seems to pass exactly through the center of the cornea. The carrier which the person is still observing is then moved along the bar, until it reaches such a position that as the examiner looks through the ophthalmometer the hair seems just to touch the edge of the observed cornea. The distance from the carrier to the center of the rod—DA or DB—is then measured, which distance we shall afterwards refer to as *b* (see Fig. 97). It is wise in this connection to perform the same operation on the other half of the bar in order to check the result. If the observation has been made carefully the two distances should be equal. We are now ready to calculate the center of motion.

FIG. 97.—Let ABD be the horizontal rod, A and B the carriers, FEG the chord of the cornea, C the center of motion. The eye is so placed that FG is parallel to AB and the line CD passes through C the center of motion, E the center of the chord, and D the center of the telescope. Hence let $DE=a$, $EC=y$, $AD=b$. From expression (1), we have $330 : 2.95 :: a : FE$. $FE=\frac{2.95,\,a}{330}$ Let $\frac{2.95}{330}=m$, which is a constant for any given instrument, then $FE=ma$. In the similar triangles FEC and ADC, $DC : AD :: EC : FE$. $y+a : b :: y : ma$. $mya+ma^2=yb$. $ma^2=yb-mya=y\,(b-ma)$. $y=\frac{ma^2}{b-ma}$

If we call *m* the "deviating power of the prism," then we can express this formula as a rule which in reality is not as complicated as it sounds.

The distance of the center of motion from the transverse chord of the cornea is equal to the quotient of the product of the deviating power of the prism multiplied by the square of the distance from the transverse chord of the cornea to the brass rod, divided by the difference between the distance of the pointers from the center, and the product of the deviating power of the prism multiplied by the distance from the brass rod to the cornea.

The following is a calculation of this rule arranged for logarithmic computation:

$a = 662.5, b = 359.3.$

$m = \frac{2.95}{330.}$ log. 2.95 = .469822+0.

log. 330. = .518514+2.

.951308—3 =log. .008938

m = .008938 .951408—3 b= 359.3

log. m =

log. a = .821186+2

.772494+0 = log. 5.9223

log. ma =

353.38 = (b—ma)

.821186+2

log. ma^2 = .593680+0

log. (b—ma) = .548242+2

.045438+1 = log. 11.1029

Add the distance of the chord of the cornea from its anterior surface or the vers. sin of corneal arc = 2.5

Location of center of motion behind the cornea (radius) = 13.60+

§ 5. **The Angle Alpha.**—The text-books usually represents the lens and cornea as if both were exactly centered. We have already seen that the former is often displaced from the position which theoretically it should occupy, and exact measurements also show that the center of the curvature of the cornea does not always correspond to the axis of the lens. All have agreed, however, to call the optic axis the line which passes through the nodal points of the lens and approximately the center of the cornea (A A, Fig. 98), and also to call the *visual axis* the line which passes from the object O to the *fovea,* OF. Unfortunately confusion has arisen as to the name of the angle which the optic axis makes with the visual axis, and it is well to clear up this point before proceeding farther. When Donders made his important investigations concerning the size and position of what he called the "angle alpha," he referred to the one which the visual axis makes with the optic axis. Since his time, however, it was found that the apex of the corneal ellipse (E) does not always coincide with a point in the optic axis (C). Hence OXE was called by Landolt and some others the *angle alpha* and OMA the *angle gamma.* But many other writers still describe the angle alpha as the one which the optic axis makes with the visual axis, that is OXA. Maddox (B 263. p. 217) tries to clear up the confusion by describing the "angle alpha of Donders" as one angle, and the "angle alpha of Landolt" as another. In order to be rid of this ambiguity, it seems better to follow the example of Donders, as Tscherning and others have, and retain the term "angle alpha" to describe the one which the visual axis makes with the optic axis OXA, to agree with Landolt in calling the angle OMA the angle gamma, and then to the angle OXE give an entirely different name—for example, the *angle delta*.

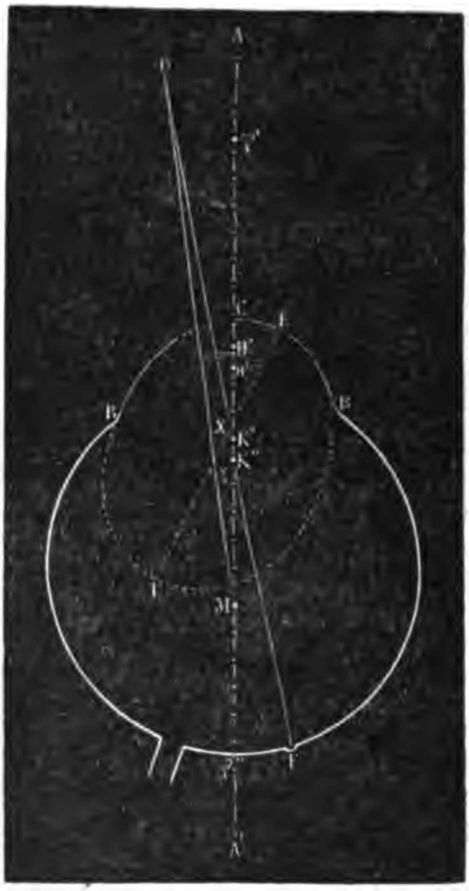

Fig. 98.—Horizontal section of the globe with distortion of natural curvature of the cornea to show the direction of the various axes in the horizontal plane (Landolt.)

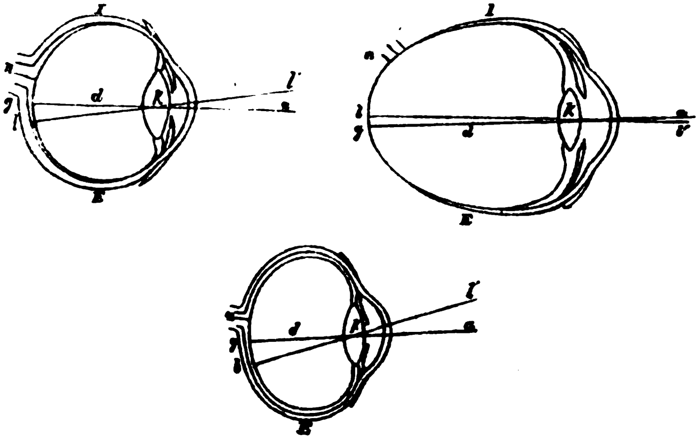

Fig. 99.—The angle alpha in emmetropia, myopia, and hypermetropia, *ag* is the optic axis; *ll*, the visual axis (Donders).

It happens that we have to deal frequently with this angle alpha, but the angles delta and gamma are only of theoretical importance.

The size of the angle alpha varies. In emmetropia it ranges ordinarily from three to five or six degrees or sometimes much more. When unusually large, the eye has every appearance of a divergent squint, although the visual axes may be perfectly parallel. In myopia the angle is less than in emmetropia, in fact it is often reduced to nothing, and sometimes the anterior end of the visual axis falls to the temporal side of the optic axis. In that case the angle is said to be negative (Fig. 99).

GUMMATIE OF THE CORNEA.*

By Dr. Albert Terson,

PARIS.

Before the researches of Hutchinson, the syphilitic origin of certain cases of Keratitis was unknown, and, although accepted by most ophthalmologists and denied by some nevertheless, this origin is now considered as a positive fact in science.

The following report is offered from the clinical and etiologic points of view:

Philomena T., corset maker, age 22, presented herself for the second time in our clinic on November 3, 1904, the first being about four years previously, in consequence of an interstitial Keratitis in the right eye of medium intensity, which was cured solely by internal treatment. (Biniodide iodo tonnate, alternating with calomel and atropin.)

Family history indicated that her father, before his marriage suffered from syphilis. The issue of this marriage was two daughters and a son. personal history shows that the patient has suffered from no serious ailment. However, attention is called to the fact that, during her infancy, and for several months, she complained of a knic, such as is frequently observed in cases of hereditary syphilis.

In addition to the monolateral keratitis mentioned, the left eye presents the following lesions: Peripheric pigmentary choroido retinitis, the papilla being slightly pallid with the charastic aspect, at once oldematous and cictritial: the acuteness of vision is not more than one-fourth, without appreciable error of refraction condition not improved by glasses. Typical teeth. The object of the consultation on November 3, 1904. was the treatment of a slight parenchymatous infiltration of the right cornea, with a most violent iritis. Nothing particular observable in the left eye. In the right eye besides the opacity, which nevertheless showed clearly the pupil and the synichias the margin and the adjoining corneal sclerotic was found slightly enlarged and infiltrated toward the lower part of the eye appearing like the development of a new formation or infiltration in the irido corneal angle. The patient was put under treatment by means of intra-muscular injections in the gluteal region, with an oily biniodide camphorated and guiaculated. The addition of the synthetic guiacal (1 gramm to 30 cc. oily binoidide has been recommended by E. Bozin. and lauded by Lagrange and has the advantage that it causes less discomfort in the intra-ocular injections. We also used once the solution of panus 4/1000 of which we injected two cubic centimeters. The patient also took, on alternate days, Gibiert's syrup, which was rendered less insipid by the addition of a small quantity of iodo tannic syrup.

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*Archivos de oftalmogia Hispano Americanos, June. 1905.

After several injections the condition of the eye was improved, the iritis was cut short, although the corneal opacity persisted permitting the dilated pupil to be seen, through the action of the atropin. The treatment was continued and when about twenty intraocular injections had been administered, a violent relapse supervened; the margin enlarged, anterodownward, and yellowish infiltrations, the most intense, appeared in the lower part of the cornea. At the end of several days a yellow point was manifest in the external paracentral region of the cornea. This took the form of a tear (Lagrima) of great volume in its lower extremity, and its borders were circumscribed, as may be appreciated in the accompanying figure which was drawn on February 20th; the yellowish mass having acquired the dimension of a grain of hemp. Although interstitial, a prominence was shown towards the outside of the cornea in the anterior chamber, without any alterations at its level.

In consequence the diagnosis was formulated of a gumma in the cornea and being desirous that two competent persons should confirm the existence of this fugitive lesion, I presented the patient to Drs. Moax and Antonelli, my distinguished colleagues, who confirmed my diagnosis. In view of this, I have had the model and water color of the lesion drawn.

Then the patient submitted to injections of calomel, the beneficient results of which have been appreciated in perforating gummata of the ciliary body, in cases in which no satisfactory outcome have followed other methods of medication.

I did not use intravenous injections because I have observed that they had not given flattering improvement, from the 20th of February. I made four injections of fine centigrammes of calomel (twice a week) and after the second injection the gumma, although it had not opened, was nearly so and reduced in volume; at the third injection it acquired a gray tint, terminating by being absorbed, leaving a small opacity. I have not succeeded so well with the infiltrations of the lower part of the cornea, and the raising of the margin.

In my judgment there had been grave lesion of a gummatous character in the angle of the iris, and perhaps, also, behind the iris. During several days, the eye was very hypotonic but actually the inflammation has disappeared and the visual acuteness is 1/15. This explains to what a point the gravity of this segmentitis anterior had attained which the calomel had prevented reaching the atropio.

During the time that the injections have been employed. calomel has also been used internally, and also the various forms of iodide medication.

In view of the above history of facts, we have become convinced that we have treated a gumma of the cornea, founding our opinion upon the following reason. In addition the father's confession of syphilis, the stigmata in the fundus of the other eye, the anterior parenchymatous Keratitis, in the special form of the lesion, this completely yellow mass prominent outside and inside the cornea, circumscribed like an oblong pearl; these details have no analogy with any other lesion of the cornea.

Grouping all the antecedents, so said Dr. Antonelli after examining the patient, no difficulty is offered to diagnosticate a gumma of the cornea: in every case that shows no plastic deposit, no abscess, no bacillary lesion can assume this surprisingly particular aspect, which does not disappear in several days without ulceration, without direct treatment by injection of calomel.

In summing up no reason justifies the assumption that the cornea cannot be attacked by gumma.

It is known that before Hutchinson's time, it was considered that the cornea enjoyed endemnity against syphilis, but actually after 102 reports in the work of this author, and above all the cases which are daily observed in independent practice, the convictions has become manifested that such affomation has no value whatever, in effect, was it not admitted as an irrefutable argument against hereditary syphilitic Keratitis, that acquired syphilis Keratitis, that acquired syphilis never attacked the cornea? It has been thus affirmed, but today there is no doubt whatever of the existence of interstitial Keratitis, of syphilitic origin, and while the cases are rare, its recognition has become evident in a number of cases.

To verify this, the recent work of D. Villard* may be consulted and in addition we would call attention to our own observations accompanied by the presentation of cases to the society of ophthalmology of Paris in 1901.

Gummata may be found in the cornea, the same as in the iris, in the ciliary body, in the conjunctiva, in the sclerotic, and episclerstic, in the lids, in the orbit, and its frontal, malar and lachrimal border. With the certain reserve, corneal gummata are admitted by Magin, Galezonski, Denaire, Lang, Peters, Vinsonnean. We have seen two cases in the course of an intense interstitial Keratitis, one time in the eye of a child and the other in which both eyes of a young girl were attacked true affections of the cornea, which had many points of similarity to a gummy fusion which atrophied both corneas.

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*Villiard-alteracioues de la Cornea en la sifilis adguiaorda. Ann. d Ocul., 1904.

Dr. Abadic, by preference, has occupied himself with cases of malignant interstitial Keratitis.

Hutchinson, to whom we always come back, on such occasions, has an admirable plate, in which is deposited the gravest case which he has ever seen, in which the centre of the cornea is found occupied by a yellow and concrete mass.

Dr. Rollett* believes that in many instances distrophic and slight interstitial Keratitis, in which time treatment has given good results there still exists grave syphilitic Keratitis, in which the mercural treatment is the only one indicated excepting in rare instances this method of treatment has worked with rapidity. On the other hand in a patient in whom one eye was nearly useless in consequence of a pigmentary chorio retinitis, with atrophy of the optic nerve, the interstitial Keratitis of hereditary syphilitic origin was only improved under the exhibiton of injections the effect of which was immediate, to our great surprise, respecting the hereditary origin of gummata, we know that hereditary syphilis is slow in developing gummata in the ciliary body conjunction (cirincine) palpebon de lopersonne and diffuse palpebral syphilloma (Simon).

We have seen the nasal duct and the inferior turbinate bone destroyed by gumma, in a little girl whose mother was a declared syphilitic.

Although the typical intra corneal gummata may be rarely observed, we believe, nevertheless, that we have proven their presence in hereditary syphilis as a late manifestation, that same as acquired syphilis. Aud, further, that intense mercurial treatment, above all by means of calomel injections, presents special favoring conditions for their absorption, without alteration, in the same manner as it does for gummata in the rest of the organism.

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*Rollet la Quertitis haredo siplitico (Rev. Gen. De ofthalmogia 1904).

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

MEETING HELD THURSDAY, JUNE 14TH, 1906.

The President, Mr. PRIESTLY SMITH, F. R. C. S., in the Chair.

MR. NETTLESHIP and **MR. MENTEITH OGILVIE** gave an account, with diagrams and drawings, of a family in which twenty persons in four generations had a peculiar variety of

Partial Congenital Stationary Cataract

in the form of a perfectly circular, well defined, homogeneous or finely granular layer of no great density, situated between nucleus and posterior pole, about 4 mm. in size. At first sight it might be taken for a small lammellar cataract, but the invariable absence of any trace of a second layer and the certainty that the opacity lay beind the nucleus negatived that diagnosis, whilst there was equally good evidence that it lay in front of the posterior pole. Some of the cases were first seen by Dr. Doyne at Oxford several years ago. These were re-examined by Mr. Ogilvie and were found to be unaltered, and he has recently discovered a large number of new cases. The change caused but little loss of visual acuity, and only a slight desire to shade the eyes against bright light; hence the number of cases could only be determined by ophthalmoscopic examination of every accessible member of the family. Mr. Ogilvie examined about fifty persons, whilst one group living at Edinburgh was examined for the writers by Mr. G. Mackay. All the cases occurred in one branch of the family tree.

MR. SIMEON SNELL (Sheffield) read a paper on

Steel Alloys Which Are Not Magnetic.

He mentioned that during recent years steel alloys had been used in certain industries, and that these alloys had altogether different magnetic properties to ordinary iron or steel. Manganese steel which contained 12 per cent. of manganese, 87 per cent of iron, and 1 per cent of carbon, formed a very hard steel which was difficult to machine, but the point of interest was that it was non-magnetic. Its toughness made it useful for many purposes. Nickel and iron was another alloy, and this was as susceptible to magnetism as pure iron, but the admixture of a small percentage of magnanese and carbon completely altered the magnetic properties. Thus a mixture of carbon, 0.4 per cent, nickel, 20 per cent, and manganese, 9 per cent, with iron, was absolutely non-magnetic. Another point was that if this same alloy were drenched in liquid air it became magnetic. Another alloy was chromium steel. It was magnetic but less so than ordinary steel. Specimens of these were exhibited, and their magnetic peculiarities were demonstrated. Mr. Snell remarked that, fortunately, the vast bulk of all steel splinters penetrating an eye-ball came from steel which was magnetic, and therefore, the use of the electro magnet was unaffected. The possibility of steel being non-magnetic should be borne in mind, and inquiries made as to the particular kind of steel from which the fragment injuring the eye became detached. In conclusion, Mr. Snell referred to other alloys which were highly magnetic. He had not, however, yet found that they were more magnetic than the soft iron in use had been.

Messrs. L. V. CARGILL and S. MAYOU described a case of

Miliary Tuberculosis.

in an adult in which there was tubercle of the choroid with implication of one optic disc. The patient was a man, æt. 21, who was admitted into King's College Hospital in December, 1905. Although previously healthy, he had been feeling unwell for six weeks, and was supposed to be suffering from influenza. He perspired a good deal, was feverish and was losing weight. There were no physical signs in the lungs, and no tubercle was found in the expectoration nor blood. Opsonic index to tubercle was: 1. Two weeks later an irregular yellowish white patch was found in the right eye, near the disc, it was only slightly elevated, and there was no pigment. In the left eye there were signs of optic neuritis. The irregular pyrexia continued and signs developed in the lungs. On February 17th, tubercle bacilli were first found in the sputum, and death occurred three days later. The post-mortem showed that the meninges were studded with tubercle so also were the lungs and most of the abdominal viscera. The sections of the eye showed a typical tuberculous mass situated at the edge of the choroid on the outer side of the optic nerve, this mass involved the nerve and spread backwards through the lamina cribrosa. The anterior part of the globe was normal except for a congenital anterior synechia.

ABSTRACTS FROM ANGLO-AMERICAN LITERATURE.

BY

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HAROLD G. GOLDBERG, M. D.,
PHILADELPHIA.

FRANK C. PARKER, M. D.,
NORRISTOWN, PA.

AND

OSCAR WILKINSON, M. D.,
WASHINGTON.

Color Conversion.

STEVENS, GEORGE T., New York (*Journal A. M. A.*, July 21), relates several experiments which he has made in recent years with a previously unobserved color conversion phenomenon, which he describes in detail. He says that if in the midst of a somewhat extended surface of a given color a narrow strip of complementary color is viewed with a fixed gaze, the narrow strip will be eliminated and its place taken by the preoccupied color. It is not, he states, a color illusion, and it differs from the color phenomena usually hitherto described. He states that two principles are involved: First the difference in refraction of the various colored rays entering into the experiment; second, the adaptation of the eye through the act of accommodation to a place in advance of the surface on which the two colors are imprinted. The article is accompanied by a colored illustration.

Staining Methods for Eye Bacteria.

THOMSON, E. S., New York (*Journal A. M. A.*, July 14), describes the staining methods used for eye bacteria employed at the Manhattan Eye, Ear and Throat Hospital. Film preparations from fresh conjunctional discharge represent the most of their work, and he cautions against any roughness in transferring the film that might derange the relations of cells and bacteria. Loeffler's methylene blue is the stain most employed —30 parts to 100 parts of a 1 to 1,000 aqueous solution of caustic potash. Counterstaining with eosinate of methylene blue is also used to advantage to bring out details, and Gram's method of decolorizing is of value for diagnostic purposes. The principal germs, the gonococcus, the Koch-Weeks bacillus, the diplococcus of meningitis, the Morax-Axenfeld bacillus, the xerosis bacillus, the pneumococcus, etc., together with the staphylococci, streptococci, etc., are mentioned as the principal eye bacteria and their staining peculiarities are noted. Scrapings and tissue preparations are also of advantage in certain cases. The latter are advised in cases of suspected tuberculosis for which the well-known carbol fuchsin method can be employed, or in certain cases the toluidin or Unna's method can be used, both of which are described.

Convergent Squint.

JACKSON, E., Denver (*Journal A. M. A.*, July 14), gives the later result in the case of a patient with convergent strabismus, who was operated on according to the method previously described by him (*The Journal A. M. A.*, Aug. 19, 1905) of dividing the insertion of the internus and the nasal half of the insertions of the superior and inferior recti after previous stretching, five years before. The patient has not used glasses for nearly a year; vision is R. 4/12 mostly, L. 4/12, neither improved by glasses. The muscle tests show complete orthophoria at distance with exophoria, 8 centrads, at 12 inches. She is given R. and L. + 0.75 sph., with prism 1.5 centrads, base in, for near-work. The case, he says, "illustrates the permanence of the results obtained by extended tenotomy. The primary adductor and abductor, the internus and externus, tend to equilibrium with the eye directed forward. The secondary adductors (the superior and inferior recti) and the secondary abductors (the obliques) tend to turn the eye ever more strongly in or out. A rational operation to correct excessive convergence must tend to lessen the relative influence of the secondary adductors.

A More Uniform Standard for the Illumination of Visual Test-Types.

WILLIAMS, C. H., (*Boston Meeting of the American Medical Association*, June 5-8, 1906) realizing the necessity of a standard of illumination and a means of measuring it, has devised a method of producing such a standard which he measures by two photometers of his own design. Consequently he urges its acceptance for uniformity in results. In the matter of illumination, he states that the most satisfactory results have been obtained by hanging the card of test-types in a cabinet painted a dull black, the opening being three feet wide by four feet high. On each side of this rectangular opening, right and left, is arranged a vertical column of small incandescent lamps of 5 candle power each, eight on each side, made to burn four in series on a current of 110 volts. These lamps are arranged at equal intervals, the highest and lowest being as near the top and bottom of the cabinet as possible, and are so placed that the lamps of one side come opposite the intervals between the lamps of the opposite side, thus making a more even distribution of the light. This vertical column of eight lamps on each side is protected by a blackened tin screen so that no light will pass direct from them to the observer, but so that the full amount of light will be thrown on the test card. The lights are one foot in front of the plane of the test-types, and about fourteen inches from the nearest edge of the card, and "frosted" bulbs are used. He seems inclined to think that the paper on which the test-types are printed should be of a light brownish tint or what amounts to the same thing should be kept in use when darkened by age.

A description of his simplex photemeter for the comparison of the light reflected from different test cards or from the same card under varying illumination. This photometer consists of two developed glass negatives cut in strips about six inches long by three-quarters of an inch wide, placed face to face and mounted in a metal case. The film on each negative increases in density in a geometrical ratio from the clear end toward the deuce end. To measure the brightness of a light the photometer is held in front of the eye so that the light to be measured is seen through the clear end of the photometer film, the glass is then slowly moved so as to bring the denser portions of the film in line with the light until a point is found where the light is just extinguished by the absorbtion of the film. The amount of light cut off by the film at this point measures the intensity of the light tested, and can be read off on a scale attached to the glass photometric negative. The negative is mounted in a metal case shaped like a razor case, a sighting hole is punched in both sides of the case through which the light to be tested is observed, and directly below this is another hole in one side of the case through which the scale of the instrument can be read. A description of the manner in which the accurate marking on the scale and the standardization of the negatives were accomplished is given in detail. A second photometer was constructed in order to make an accurate comparison of the photometric films with the standard shade glasses. A description of this apparatus is also given.

S. H. B.

Dermoids of the Orbit.

POLLOCK, W. B. I., Glasgow, Scotland (*The Ophthalmic Review*, June, 1906), reports a case of dermoid of the orbit occurring in a healthy boy, twelve years of age. The visual acuity was normal in both eyes. The condition had been present from infancy and manifested itself as an enlargement, the size of a large bean, in the anterior part of the left orbit in its upper and outer quadrant. It had no fixed attachments, either superficial or deep, and was of firm, elastic consistence. It was unattended by pain or tenderness and did not restrict the movements of the eyelid. The growth was removed in its entirety and subjected to a miscroscopic examination which showed it to be a typical dermoid of slightly oval shape measuring on the slides 8x9.5 mm. The contents were mainly sebaceous material, with a few cells, and a number of loose hairs. There were no cholesterin crystals, bone, or teeth. The report includes two photomicrographs which illustrate the histology very well.

In discussing the subject of orbital dermoids, this observer states that they are always congenital, but may grow considerably after birth especially at puberty. The most frequent situation is at the upper and outer angle of the orbit as in this case. In this region such growths rarely exceed the size of a small grape. Less frequently they are found at the upper and inner angle of the orbit and are then much larger and may extend into the orbit and may even perforate the bone. Such growths may be found to be connected with the dura by a pedicle. The least common situation is in the upper eyelid unconnected with the periosteum. While small, he states, they cause no inconvenience and are nearly always freely movable except occasionally when cystic. Cystic dermoids may be adherent to adjacent structures. The paper concludes with references to the observations and views of the histopathology and development as recorded by the various workers in this line.

S. H. B.

Howe's Resolution on Test Methods.

HOWE, DR. LUCIEN, of Buffalo, realizing the great need of a standard method of expression for functional defects of the extraocular muscles, presented the following resolution before the Section on Ophthalmology, A. M. A., at their recent meeting in Boston, June 5-8, 1906:

"Whereas, It is a well established fact that when making tests of the strength of the extraocular muscles, if the examiner selects different prisms from the test case, or when using prisms in series, or revolving prisms, if he begins with those which the patient can not overcome, and gradually decreases their strength to a prism which the patient can overcome, then one set of results is obtained. But on the other hand, when using prisms in series or revolving prisms, if the examiner begins with those which the patient can overcome, and gradually increases the strength of the prisms, then the one found necessary to produce diplopia is decidedly stronger than by the former method; and,

Whereas, When the former method is adopted the results are much more constant and exact than by the latter method; and,

Whereas, No matter in what way the measurements have been made, when the result is recorded in the strength of the prism, which can be overcome, some practitioners count that as if a prism were held before each eye, and others as if one prism of twice the strength were held before one eye only; and,

Whereas, These differences in methods of using prisms and of recording the results of tests, have given rise to different estimates of the strength of the extraocular muscles, with corresponding confusion of our ideas on the subject; and,

Whereas, One of the prime objects of a national medical association is to make our methods and records more uniform, and, therefore, more intelligible to ourselves and to each other; therefore, be it

Resolved, That it is the sense of the Section on Ophthalmology of the American Medical Association, that hereafter, when any member describes the strength of the extraocular muscles, it is to be understood, unless specified to the contrary, that in making these measurements the examiner has used prisms selected from the ordinary test case, or if he did use prisms in series or revolving prisms, in doing so he commenced the measurement with prisms which were sufficiently strong to produce a well marked diplopia, and then decreased the strength of the prisms until one was found which could be overcome by the patient; and,

Resolved, That in recording the strength of the prism which can be overcome by any such tests, it is to be understood, unless specified to the contrary, that the number given is to express the total fusion power, that is, the strength of the one prism which is required to produce the result, and not half the fusion power, as when a prism of half that strength is held before each eye."

The importance of this step cannot be overestimated. Cooperation in this regard will serve to provide order out of what is now truly chaos. It is hoped that the ophthalmic public will hasten to endorse the plan by their acceptance of its suggestions.

Extirpation of the Lacrimal Sac.

BREWERTON, E. (*The Ophthalmoscope,* April, 1906), in a communication read at the Harveian Society, London, in the fall of 1905, reviews the knowledge of extirpation of the lacrimal sac in a very creditable manner. He has no hesitancy in stating that disease of the lacrimal sac in most cases is secondary to disease about the inferior meatus of the nose, causing obstruction to the lower end of the nasal duct, retention of discharge in the duct and lacrimal sac, and subsequent inflammatory changes in the lining membrane of these passages. He advises examination of the nose before treating the lacrimal condition directly, since in many cases of short duration, he finds that nasal treatment is often all that is required. This is a good point, and while perfectly obvious to those familiar with the structure and function of these parts, it is astounding to note how many disregard the possibility of cause of lacrimal disease, existing at the lower end of the nasal duct.

The historical notes contained in this paper inform us that destruction of the lacrimal sac dates back at least 1,800 years. Reference is also made to the means employed for the cure of lacrimal disease by Celsus, Galen and Paulus Aeginata. The cautery seems to have been quite popular with these ancient surgeons. Perhaps the earliest extirpation was performed by Platner in 1724, who combined the operation with the formation of a false passage into the nose. Rosas attempted to revive this operation in 1830. Hatter in 1867, Berlin in 1868, and Schreiber in 1881, are properly accredited with having given the operation the place to which it is entitled in ophthalmology. The anatomy of the lacrimal sac is briefly given. The indications Brewerton gives for extirpation of the sac differ in no wise from those generally accepted. The methods of procedure in the operation are given in detail and are well worthy of perusal. The results he finds to be very good. In concluding the paper, he refers to the organisms commonly found in the pus which he states are streptococci in acute lacrimal abscess, and staphylococci and penumococci in chronic conditions, occasionally bacillus coli communes and sarcinæ, rarely actinomyces. Many of the lacrimal sacs after removal, when examined under the micriscope show the appearance typical of tuberculosis.

A New Supplementary Color Vision Test.

Black, N. M., Milwaukee, Wis. (*Journal A. M. A.*, June 23), remarks on the defects of the color vision tests usually employed, the inability of the Holmgren test to detect all forms of color defects, the failures of the lantern tests, especially in color myopia, etc., and describes a device of his own in which are utilized the optical laws that reduce the apparent size of an object when looking through the wrong end of a telescope. The apparatus consists of a tube with a dead black lining mounting a combination of biconcave lenses and fixed in a screen so as to prevent the subject of the test from seeing the source of the illumination, which consists of three standard semaphore lanterns arranged in a right-angled triangle at a given distance from the tube. These are fitted with frames in which the various colored glasses used for the tests can be placed. An attempt to produce the effects of fog, smoke, steam, rain and lowered intensity due to different atmospheric conditions, is made by interposing ground glass, smoked glass, etc. The person examined sits behind the screen and looking through the tube is asked to say what the different signals indicate, according as the lenses are adjusted to produce the effects of distance and the various conditions met with in actual railroad practice. The test, he says, "fits exactly the conditions found in practice. The objects used in testing are the same used in actual practice, the person tested is required to designate what he sees, either by name or to indicate its meaning, which he does in practice. The fault of all lantern tests is overcome by simulating distance by a relative reduction of the size of the image. The factor which gives the success to the Holmgren worsted test, that of comparison, is followed, the impression of distance is maintained and the test may be used as an office test. The only thing we can not do is to produce a gale of wind or a rain storm or the road and noise of the engine for the benefit of the candidate while being examined." Formulas are given for the lens adjustments for apparent distance, also figures of the apparatus.

Inflammation of the Conjunctiva.

Ramsay, A. Maitland, Glasgow (*The Medical Press*, June 13, 1906), in a clinical lecture delivered before the Glasgow Ophthalmic Institution, upon the subject of inflammation of the conjunctiva reviews the current thoughts and opinions in a most masterful manner. The lecture is most instructive and embraces many points of practical importance. For instance, regarding the congestion incident to conjunctival inflammation he states:

"The resulting redness is one of the earliest as well as one of the most characteristic signs of conjunctival inflammation. Every eye that is red is not, however, to be regarded as suffering from conjunctivitis, and careful examination will readily distinguish injection of the superficial or conjunctival vessels from hyperæmia of those that are more deeply placed. In the former condition, which denotes inflammation of the conjunctiva, the tint is brick-red, most intense in the region of the retrotarsal fold; the congested vessels are comparatively large and tortuous, and are arranged in the form of a network freely movable with the ocular conjunctiva; pressure will momentarily drive the blood away and expose the sclerotic; there will be lachrymation and intolerance of light; and the pain is similar to that experienced when a foreign body is lodged between the lids and the ball. Hyperæmia of the deep-seated vessels denotes implication of the cornea or iris, and then the colour is rose-pink and the congested portion forms a zone round the cornea; the distended vessels are minute and hair-like and lie in the episcleral tissue under cover of the conjunctiva; pressure does not materially diminish the amount of vascularity; the pupil does not react promptly to the stimulus of light; and the pain complained of has a characteristic throb, is markedly nocturnal, and is usually circumorbital. Should the injection be localized, the fascicle of blood-vessels running towards the cornea invariably terminates in a phlycten or an ulcer; and should the vessels, more especially the veins, be large and varicose there is probably deep-seated mischief in the choroid, and the more livid the congestion the more serious the inflammation. Where, as is very often the case, superficial injection and deep injection co-exist, it is, as a rule, easy to determine by careful inspection which of the two predominates."

The lecture also thoroughly covers the etiology and pathology. Diphtheritic conjunctivitis is described at great length.

Ante-Partum Ophthalmia.

Stephenson, S., and Ford, R. (*The Ophthalmoscope*, April, 1906), have recently published an analysis of a table of 31 cases in literature and 17 cases personally observed, to demonstrate the occurrence of ante-partum ophthalmia. The table is rather formidable and the analysis would seem to prove undoubtedly the contention of these observers. Its peculiar nature prevents abstracting without changing the meaning so accordingly only the conclusions may be quoted: "1. Instances of ante-partum ophthalmia are not so uncommon as hitherto believed. 2. About one-half of the cases (44.5 per cent) are satisfactorily accounted for by a premature rupture of the membranes allowing access of micro-organisms to the baby's conjunctival sac. 3. In the remaining cases (55.5 per cent) a slight injury to the membranes may determine access of micro-organisms, or infection through the uninjured membranes must be assumed to have taken place. 4. Increased temperature of the conjunctival sac *in utero,* enhanced virulence of the causative micro-organism, feebleness of the babies, slight lateral tears of the membranes, position of the fetus in the maternal passages, and the condition of the placenta cannot be shown to be connected with the causation of ante-partum hemorrhage. 5. Several of the so-called 'congenital' anomalies of the eyes as corneal opacities, staphyloma, microphthalmos, cryptophthalmos and lacrimal abscess are probably to be explained on the theory of an intra-uterine infection."

Choris-Vaginal Veins.

Coats, George (*The Ophthalmic Review*, April 1906), in a recent contribution concerning the pathology of choris-vaginal (posterior vortex) veins reviews the literature of this subject and discusses the several features of these vessels at great length. The pathologic anatomy is considered in detail. In his conclusion he submits the opinion that the choris-vaginal veins are, anatomically, large veins which pass from the choroid into the nerve and course backwards close under the pial sheath; that they are formed by enlargement of the anastomoses which normally occur in this situation; and that this enlargement constitutes in most cases a collateral circulation to compensate for a hindrance to the exit of blood by the normal vortex veins.

Spasm of the Retinal Artery and Its Relation to Transient Blindness.

Lundie, R. A. (*The Ophthalmic Review*, May, 1906), in a paper bearing upon transient blindness due to spasm of the retinal artery, refers to the cases in literature and states that the instances in which the fundus has been examined during the attack are few in number. This is in large part due to the great variation in the duration of the attacks so that is only when they are prolonged that opportunities for examination have been afforded. It is on the characteristics of these cases that Lundie's remarks are based. He makes reference to the important features in the cases recorded by Wagenmann, Noyes, Loring, Raynaud and Benson. The causes, he gives, include epilepsy, migraine, malaria (cold stage), and certain topic conditions especially poisoning by quinine.

The case which Lundie had the privilege of observing occurred in a gentleman, 88 years old, with generalized lowered muscle-tone. His arteries though somewhat tortuous were much less hard than would be expected at this age. The mental faculties were good. He was the subject of a slight bronchitis, but otherwise the organs were normal. He had had lumbago and dry pleurisy some time previous to the present condition. By reason of general enfeeblement, he was confined to bed at the time of the onset of the present condition which was manifested by a sudden loss of vision in the left eye. One-half hour later the upper half of the field was found to have some perception, but the lower part remained blind.

Upon ophthalmoscopic examination (indirect method), Lundie found the fundus appearances negative except the upper main branch of the retinal artery. In this there was an interruption of the column of blood just beyond the margin of the disk, in a section of the vessel somewhat less in length than one disk-diameter. The position of this part of the vessel could be traced as a whitish streak, but it seemed entirely empty. On the proximal side the vessel was of normal calibre, on the distal side, the column of blood was continuous, somewhat less than in the other arteries of corresponding rank. A few minutes after the administration of a dose of whiskey another examination was made. It was then observed that there appeared to be a fine thread of blood in the portion of the artery previously empty. The lower field was still blind. Within an hour after the abrupt onset, the obstructed artery was found to have recovered its normal appearance and the vision had entirely returned. Lundie considers that this case was one of localized spasm of the artery, and the duration, course, and appearance seem to support this contention.

The importance of this class of cases to Lundie's mind lies in the possible confusion with embolism. He says there are many cases recorded as embolism in which the final attack has been preceded by one or more attacks of transient loss of sight. In embolism, the final attack differs from spasm only in that the blindness is permanent. He seems to regard it as improbable in these cases of alleged embolism, that successive emboli from distant sources should all find their way into the same small arterial branch. He notes, however, that cases of recurring transient blindness are eventually followed by permanent visual disturbances, where blindness occurs, the clinical features are essentially the same whether transient attacks have preceded it or not.

Another case seen in the practice of a colleague is referred to which possessed the singular feature that one side of things looked higher than the other. This vertical diplopia always preceded the blindness and was likewise transient. This was probably due to extension of the spasm beyond the retinal arteries to those of some part of the extraocular neuromuscular apparatus.

Lundie advises that when a case of transient blindness is seen at an early stage with signs of arterial obstruction present, the possibility of its being due to spasm should be recognized and vigorous attempts made by massage, amyl nitrite, and other vascular relaxants to promote dilatation of the arteries. Such procedure may serve to restore sight which would otherwise be lost. In recurring attacks a search should be made for constitutional factors and care should be taken to promote very free elimination of waste products. Iridectomy is recommended by some observers.

The contention throughout this very interesting paper is to assign a definite place in ophthalmology for spasm of the retinal artery as a cause of certain cases of transient blindness. In cases in which the fundus changes are such as he describes, there seems to be little doubt as to the true nature of the condition. The temporary nature of many of these attacks prevents satisfactory ophthalmoscopic examination and it is in these cases, especially when recurring, that he thinks a possibility of spasm of the artery should be entertained and the treatment instituted accordingly. The dearth of discussion on this subject is offered as an excuse for the long abstract of this paper.

Uniocular Optic Neuritis and Retinitis.

HUBBELL, A. A., Buffalo, N. Y. (*Journal A. M. A.*, July 7), remarks that the ophthalmologic text-books are comparatively silent on the subject of unilateral inflammation of the optic nerve and retina. After a number of references to the literature,which, he says, is also comparatively scanty, he reports and analyzes 18 cases of his own observation within the past fifteen years. It is difficult, he finds, to fix any definite etiologic relations of the conditions. One-sided nephritis existed in one case; there was more or less arterio-sclerosis in five patients, two of whom also had albuminuria; valvular disease of the heart, together with previous cerebral hemorrhage, was found in one patient, while the remainder were classed as healthy and without cerebral, vascular or kidney disease. In a quarter century's experience in ophthalmologic practice, he has never seen a case of optic neuritis that was not uniocular except when there was syphilis or brain tumor. He has never seen a case of neuroretinitis or retinitis that was not uniocular, except where there was double orbital cellulitis, Bright's disease, diabetes mellitus or syphilis. He does not claim, however, that this must have been the experience also of others. The treatment he has employed has been almost invariably the administration of iodid of potassium, which he thinks has been of benefit in some cases. In others it seemed ineffective. Hubbell considers the condition more common than is indicated in ophthalmologic literature.

Fourth of July Eye Injuries.

RANDOLPH, R. L., Baltimore (*Journal A. M. A.*, July 7), has collected over 500 cases of eye injury occurring from fireworks during the last few years, some variety of fire cracker being usually responsible for the injury. He gives the result of work in stirring up public sentiment showing a decided decrease of such injuries in Baltimore. He laid the statistics before the leading newspapers and before the police, and secured the publication of strenuous articles on the subject and also the issuance of stringent orders to enforce the laws. He believes that much can be done in other cities by ophthalmologists in the same way, and that in due season we may be able to educate the public and to accustom it to quiet and sensible celebrations of the holidays.

Congenital Hydrocephalus.

HORSLEY, J. S., Richmond, Va. (*Journal A. M. A.*, July 7), questions the theory that chronic hydrocephalus is due to blocking of the communications between the lateral ventricles and the subarachnoid space, and holds that it is more probably caused by an excessive secretion from the ventricles rather than to an obstruction of its overflow. The surgical treatment is reviewed. Aspiration has in come cases given good results, but the method that appears to afford the best prospect for success is some form of permanent drainage. The various methods proposed for this are discussed and the one which he concludes offers the most hope is that of continuous direct drainage through some slightly aseptic material, like a malleable silver tube, producing finally a permanent fistula between the ventricles and the subarachnoid space. He reports a case illustrating some of the possibilities and also the difficulties in securing drainage from the ventricles. Four different operations were performed, in the last of which a silver canula was used, but the patient died a few days later of enterocolitis aggravated by extremely hot weather, though the head symptoms had improved.

Work of the Section on Ophthalmology of the American Medical Association.

In his chairman's address, Dr. L. H. TAYLOR, Wilkesbarre, Pa. (*Journal A. M. A.*, June 23), first mentions with regret the absence of the expected foreign visitor, Dr. Carl Hess of Wurzburg, and notices the death of one of the prominent ophthalmologists of the century, Dr. Swan M. Burnett. He then remarks on the plan successfully adopted this year, the papers prepared and placed before the members of the section so that they may be ready for the discussion, and also on the advisability of retaining a permanent section secretary. The section on ophthalmology, he claims, should be the representative ophthalmologic society of the United States, and its utterances should carry the greatest weight, especially on the questions which are still before the profession in this specialty. There are many subjects on which definite expression can not be given, but there are some an utterance on which by the section should carry authority. One of these is the amount of instruction to be given on ophthalmology in our medical colleges. Another is the question of school hygiene as bearing on eyesight, and Taylor thinks the section should specially stamp with its disapproval certain forms of kindergarten work demanding excessive use of the eyes at an age when these organs should not be subjected to such strain. Above all, he thinks that the section should give a definite expression of its views on the subject of the prevention of blindness.

Clinical Observations.

BRUNS, HENRY DIXON, New Orleans (*Ophthalmic Record*, Sept., 1905), reports the case of alteration of astigmatism due to the pressure of a chalazion of the upper lid in his own person. The refraction of the doctor as found by Dr. Howard F. Hansell of Philadelphia, in 1887, was R.=+0.50⊂+0.50 c. ax. 90°; L.=+0.25 s⊂+0.50 c. ax. 90°. V.=20/15. In 1899 the astigmatism as indicated by the ophthalmometer was R.=0.50 ax. 75°; L.=0.50 ax. 105°. In 1901 the same instrument gave an identical reading. In May, 1904, a small chalazion about three or four mm. in diameter developed, with moderate inflammation, in the upper lid of the right eye. At the same time the vision of the eye became uncomfortably dim at all distances. The vision being only 20/30 with his former correction. On May 27th, with careful measurement with the ophthalmometer showed right eye 0; L. E.=0.5 ax. 105°. Vision of the right eye with +0.50⊂+0.50 c. ax. 165°=20/20. Two months later the chalazion having disappeared his vision and the astigmatism had resumed their condition as found before the chalazion appeared. O. W.

Contact Keratitis After Cataract Extraction.

BRUNS, under the above title, reports two very interesting cases of central keratitis following cataract extraction. Each case developed a central keratitis a few days after extraction. The wounds in each case not having closed, permitted the remnants of the capsule to lie against the posterior surface of the cornea, thus acting as a foreign body, setting up an irritation and producing a central opacity. These cases are extremely interesting in as much as they are the first reported cases of a similar accident, and such a central opacity following cataract extraction would cause one a good deal of anxiety if he did not know the cause. O. W.

Sympathetic Ophthalmitis After Panophthalmitis.

WURDEMANN, H. V., Milwaukee, Wis. (*Ophthalmic Record*, Nov., 1905), reports a case of sympathetic ophthalmitis following panophthalmitis in a man aged 41 years. The patient consulted Dr. Wurdemann in 1892 on account of loss of sight in both eyes. Examination showed incomplete cataract in the right eye and complete in the left eye. Six months previous to consulting the doctor the patient had been struck in the left eye by a nail. No scar or evidence of the previous inflammation was seen at the time of examination. Believing that the right eye had not suffered from the injury, the patient was sent to a hospital and operated on for cataract in the usual manner. On the morning of the third day the patient was restless, with slight temperature, complaining of pain in the eye. On examining the eye it was found soaked in pus. The eye was entirely lost from a suppurating process. A month later on returning to his office there was an inflammed, somewhat atrophic globe in the left, while the sight of the right was diminished to perception of light, the ball tender and the pupil filled with exudate, the iris adhered to the lens; in fact a severe iridocyclitis of sympathetic type and origin. Despite the removal of the offending eye, and most energetic local and constitutional treatment the patient went totally blind.

The author gives an abstract of the only three other similar cases. Ahlstrom reports one case and Schirmer reports two. Leber, Deutschman, Gifford and others thought that the severe inflammation in panophthalmitis closed up the channels so that the germs could not pass through the lymph passages in the optic nerve to the other eye. Schirmer and Ruge are of the opinion that it is possible for the germs to pass through at times.

Influence of the Size of the Pupil in Skiascopy and a Pupil Stop.

JACKSON, EDWARD, Denver (*Ophthalmic Record*, Dec., 1905), comments at length on the influence of the size of the pupil in skiascopy and emphasizes the necessity for a small and defined light area. The writer refers to the variations in the refraction of the central and peripheral portions of the pupil, and claims that the refraction of the rays passing out of the eye cannot be ignored. The same irregularity of refraction operates on the rays entering the eye and prevents the formation of a small definite light area on the retina.

The unfavorable influence of the irregularities of refraction is reduced to a minimum when the pupil is so narrowed as to cut off the irregular peripheral zone. In skiascopy we have to depend upon light, not focused on the retina, but a circle of diffusion which depends upon the size of the pupil, hence the smaller the more defined the light area, and the greater possibility of accuracy.

As the use of cycloplegics and a dark room always tend to dilate the pupil, conflicting requirements must be considered and the unnecessary enlargement avoided. For this purpose he suggests the use of a brilliant light, not large but bright enough to cause the pupil to contract. The size of the pupil for exact skiascopy is from five to six mm. He describes a pupil-stop which may be used when the pupil is unduly dilated, it is also useful in counteracting the effect of irregularities of the periphery. O. W.

Pterygium.

SHASTID, THOMAS HALL, Harrisburg, Ill. (*Ophthalmic Record,* Oct., 1905), gives us an exceedingly interesting article on this time-worn subject. He lays special stress upon the importance of a proper definition and he submits the following as a definition of pterygium: "A fold of conjunctiva, grafted upon the cornea at, or near, its margin, pathologically but not malignantly altered, and intermittently progressive toward the center of the corneal pupillary area."

The author emphasizes the fact that a pterygium is a grafting of the upper epithelium of the conjunctiva together with the basement membrane of that structure and also some of the sub-conjunctival connective tissue, upon, or more correctly, beyond the margin of the cornea. He also lays stress upon the fact that at the margin of the cornea a small probe can usually be passed under the so-called neck of the growth (or graft) clean out on the other side. He explains the etiology of the growth in the following manner: "The conjunctiva has at some time, either from traumatism or otherwise, become swollen, then has become raw at some spot near the cornea, and, the cornea happening to be slightly denuded, the two uncovered places, one on the cornea and one on the conjunctiva, have become applied to each other by the conjunctival swelling, and the parts have united; then the swelling has subsided, and there has remained—a pterygium." He does not believe that a pterygium ever develops from a pinguecula. He rather attributes it to some foreign body lodging in the sulcus just above the ciliary border of the upper lid, which scratches the eye at different places as the eyeball is moved in different directions. It thus causes a denudation of the conjunctiva near the corneal limbus and at the same time a denudation of the cornea near the same line. "If the foreign body is so large that it will not quite denude the very bottom of the trench, you have some epithelium left, of course, at the bottom of the trench, and the swollen and denuded conjunctiva, on being squeezed over by the pressure of the lid (often gripped spasmodically) against the denuded cornea, the juxtaposed raw places united and you have a ptergium." If the epithelium does not remain at the bottom of the slcero-corneal trench we dot not have a pterygium, but get an adhesion between the conjunctiva and the cornea which does not grow and which never form a pterygium. The author claims that all true pterygiums at some time or other had this tunnel and in many cases persist indefinitely. He thinks that the canal, or tunnel, forms an excellent lodging place for the bacteria which may be the cause of the growth of the pterygium.

His treatment, which he thinks is efficient, is to cut away the pterygium and at the same time thoroughly destroy the canal. This latter he considers an absolute necessity and is confident that when it is done thoroughly there will be no recurrence of the pterygium. The most important step of the operation is the thorough destruction of the canal. O. W.

Homatropin Poisoning.

HOTZ, F. C., Chicago (Ophthalmic Record, Dec., 1905), describes a case of almost fatal poisoning by the instillation of homatropin into the eyes. The patient, aged 22, the wife of a physician, came to his office, accompanied by her husband, for examination of her eyes as she had suffered severely and frequently with headache. The usual method was used—one drop of a 2 per cent solution of cocain followed after an interval of two minutes by a drop of a 2 per cent solution of homatropin bromid, another instillation fifteen minutes later, the patient being directed to keep her eyes closed for several minutes after each instillation. Two instillations were made in the right and three in the left eye, five drops of homatropin being used. The solution was made two days before and had been used with the usual result.

When leaving the office her face was very flushed, but thinking she was unusually agitated paid no attention to it, however, that was the first symptom of a general intoxication which proved to be quite serious. Within a short time she became very excited and nauseated, vomiting clear mucous and had violent headache.

Two doses of calomel, ¼ gr. each, were given within two hours; she was unable to retain either. An ⅛ grain morphin hypodermic afforded little relief. For several hours hot and cold cloths alternately were applied to her head, which seemed to relieve her. She slept for a short time, waking up slightly irrational and was again treated with hot cloths for nearly two hours. She seemed relieved and was quiet for several hours when her breathing became so labored her husband called another physician, Dr. Wedelstaed, and for two hours both worked with her producing artificial respiration before she was able to breathe naturally. Her mind was blank for twelve or fourteen hours. Retention of urine lasted two days, but bowels were moved easily with magn. cit.

The thyroid gland was enlarged for a few days, pain about the heart was felt even at rest, any excitement would run her pulse up to 120 to 140 beats per minute.

Dr. Wederstaed says he was called about 6 a. m. and found the patient in a condition of almost profound syncope, pulse 150, weak and fluttering, respiration five per minute, all physical findings were negative, no heart lesion could be detected, the pupils were greatly dilated. Strychnin and nitro-glycerin were given, but cloths over the cardiac region and artificial respiration for two hours when the patient responded and rallied. O. W.

Therapeutic Serum for Exophthalmic Goiter.

BEEBE, S. P., New York, (*Journal A. M. A.*, September 1), reports the progress made by him in his experiments for the production of a therapeutic serum for exophthalmic goiter since his former paper was published (see THE JOURNAL, Feb. 17, 1906). From these later experiments he says that it may be safely concluded that a serum having a high degree of specificity can be prepared by injecting the purified nucleoproteids of a given organ into some animal of alien species. They also prove that absolute specificity can not be attained by this method and he believes by no other. At the time of his first report, Dr. Rogers and he had used only the serum obtained from the thyroids of fatal cases of exophthalmic goiter. Since then they have experimented with the serum derived from normal human glands obtained at autopsy, and the method of their preparation and the obtaining the serum are detailed at length. Three species of animals, rabbits, sheep and dogs, have been used for developing the serum, chiefly large buck Belgium hares which were found to give the best serum. For some reason, dogs were found to be not well adapted for this purpose. Experiments having shown that the agglutinating power of the serum is in a remarkable degree parallel with the local and constitutional reaction produced, a means of comparative standardization is afforded. As regards any hemolytic action of the serum, Beebe thinks it improbable with the therapeutic doses though he admits that it is possible that it may be greater in the living body than *in vitro*. Clinically he has observed that the serum treatment causes an increase in the percentage of hemoglobin and the number of erythrocytes, possibly due to the general health improvement and not to say direct action on the blood-forming organs. The therapeutic use of the serum is based on the theory that exophthalmic goiter is a toxemia and that the toxin in question is the thyreoglobulin. This theory best explains the striking results obtained in some acute cases with soft thyroids, probably in a state of simple hypertrophy and containing a large amount of colloid matter with but a slight increase in the number of cells. The majority of cases, however, are of the chronic type, and do not show at once this rapid improvement. The gland is more cellular and the cytotoxic element in the serum, in the small doses given, is probably too feeble to cause immediate or rapid diminution of the gland. More rapid destruction, moreover, might be dangerous in these cases. There is some reason to think that the serum does have a cytolytic effect; the main fact is that there is a reduction in the size of the gland, and in a few cases it has been restored to apparently normal size. There is an advantage in having two sources of the serum; in some cases treated at first effectually with sheep serum for a considerable period, it became ineffective to control the exacerbations that then occurred, but these were promptly controlled by the use of the serum from rabbits. It would seem that here the long continued use had developed in the patient an anti-antitoxin, and he was thus made largely immune. The immunity, however, evidently did not extend to the biologically different antitoxin. In cases requiring long continued treatment, an occasional change in the biologic character of the serum may be required. Beebe does not find from his investigations and the therapeutic tests that there is any radical difference between the normal and pathologic serums. More study and testing, however, are yet required positively to settle the question, which is an extremely complex one. If the hypothesis regarding the antitoxic and cytotoxic properties and their dependence on the injection of thyreoglobulin and nucleoproteid respectively, is correct, it will be advisable to vary the activity of the serum in respect to these two factors to meet the indications in different cases. Experiments are being made as to this question, but no statement of results can as yet be given. Considering all the facts, Beebe thinks it fair to conclude that the serum has considerable value in the medical treatment of exophthalmic goiter. The improvements and cures under its use have been too numerous to be ascribed to coincidence, and he believes that under favorable conditions much can be accomplished by careful serum therapy.

The Serum Treatment of Thyroidism.

ROGERS, J., New York (*Journal A. M. A.*, September 1), gives the results of therapeutic experiments made with a specific serum prepared by separating the nucleoproteids and thyreoglobulin from the human thyroid gland and injecting these bodies into the peritoneal cavities of rabbits, dogs, or sheep. The inoculations are continued at intervals of five or six days for about six weeks and the animals are then bled from the carotid. The serum thus obtained is presumed to contain an antibody or cytotoxin which is specific in its action on the thyroid epithelium and an antitoxin for the thyreoglobulin which is believed to be the toxic product of the gland. The latter, however, has only a theoretic existence, while the former can be demonstrated in a test tube. He speaks here of two sera used, one a pathologic one obtained by inoculating rabbits with the combined nucleoproteids and thyreoglobulin of pathologic glands; the other, called a normal serum, obtained from the inoculation of normal human glands. The pathologic serum at first seemed the most hopeful, but experience proved the differences to be less important. Rogers is in hopes that the normal serum can be made still more efficient than it has been. The statistics are given of 71 patients treated, 11 of whom have been completely cured, 42 more or less improved, 15 failed to improve as yet, and 4 died. Three of the patients who died apparetnly improved at first, one died following a subsequent operation made to hasten recovery.

Differential Diagnosis of Tumors of the Uveal Tract.

WURDEMANN, H. V., Milwaukee (*Journal A. M. A.*, August 11), takes up in detail the tumors of the uveal tract. He treats the subject mostly from the clinical standpoint. He follows the classification of LaGrange and divides these tumors into: Cysts, angiomata, myomata, sarcomata, and metastatic tumors (carcinomata and sarcomata). He considers each class separately and dwells at some length on the differential diagnosis in each variety. He states that all malignant tumors are either sarcoma or carcinoma and that the division of carcinoma into leucosarcoma and melano-sarcoma is microscopically incorrect, though necessary from a microscopic, cilnical diagnostic, and prognostic standpoint, as the less pigmented tumors offer a less unfavorable prognosis. He emphasizes the importance of transillumination in the examination of the eye. The literature is collated to date and the author has added many original observations. The article is well illustrated.

So-Called Leucosarcoma of the Iris.

Brown, E. V. L., Chicago (*Journal A. M. A.*, August 11), states Ribbert's theory of the origin of so-called leucosarcomas and reports the results of the examination of three cases of leucosarcoma of the iris, which he considers better suited for this study than choroidal ones. From these and a study of the literature he concludes that the theory is deserving of careful and further consideration. He does not accept, however, a round cell first stage as proven, hence he considers that the analogy between the round, spindle and stellate cells which proliferate in sarcoma and the spindle and star-formed cells found in the embryonic choroid, is incomplete. It is more reasonable, he thinks, to suppose that the "cell reversion" takes place to any one of these forms of sarcoma, analogous to the relations which obtain between embryonic and pathologic conditions in glioma, than it is to suppose that lower are transposed into higher cell forms. The term leucosarcoma should be retained, but used only in reference to the clinical appearance of iris sarcoma. The article is illustrated.

The Pathogenic Bacteria of the Conjunctiva.

Shumway, E. A., Philadelphia (*Journal A. M. A.*, August 4), describes the principal pathogenic bacteria of the eye. Besides direct contact contagion, which is responsible for the majority of infections, he recognizes as possible methods, dust infection and droplet infection as described by Flugge, the importance of which, he thinks, needs to be appreciated. The possible infection of the nose and throat by these organisms from the eye is also noted. The species most fully described are the Koch-Weeks bacillus, closely allied to the influenza germ, which is unconditionally contagious for the human conjunctiva, but has little resistance to drying and is, therefore, not likely to be conveyed by dust. While droplet infection or that by the medium of flies is possible, direct contact is probably the most frequent method. The Morax-

Axenfeld diplo-bacillus is now recognized as a widespread and frequent cause of conjunctivitis, usually subacute, but some times acute and even complicated with severe corneal ulceration. Dust infection by this germ is not very probable, but the droplet method is possible and infection by handkerchiefs, towels, etc., is probably of frequent occurrence. The pneumococcus is now recognized as one of the most common causes of acute conjunctivitis, and it is especially for this organism that air infection must be considered, as some of its forms retain their vitality in a dry state for long periods. The gonococcus, so well known as a cause of the ophthalmia neonatorum of infants, is but little resistant to drying but is readily conveyed by contact or soiled articles or flies in a moist condition. It is probably less unconditionally contagious than has been supposed, as uniocular cases are not infrequent and Kalt has reported a failure of an inoculation in a trachomatous child. It is not so common a cause of conjunctivitis as might be expected considering the frequency of gonorrhea, and Shumway suggests the possibility of a partial immunity of those with urethritis. The diphtheria baccillus is only moderately contagious to the conjunctiva, requiring certain conditions, especially injury or previous conjunctivitis, and the reaction varies according to the virulence of the germ or the resistance of the tissues. It is possible for a severe diphtherite pharyngitis to arise from a comparatively mild conjunctival inflammation. The micro-organism is quite resistant to drying and, therefore, dust, as well as droplet infection is possible. Of the staphylococci the only one that can be considered especially pathogenic is the *S. pyogenes aureus*. Ordinarily the staphylococci are not pathogenic to the conjunctiva and do not cause epidemics. The streptococci are a cause of pseudomembranous conjunctivitis, either alone or with the diphtheria bacillus, but they are most commonly described in lachrymal conjunctivitis, in association with dacryocystitis (Parinaud's conjunctivitis). Epidemics of streptococcus conjunctivitis have not been reported, though there is some evidence of the possibility of contact infection. In any case the streptococcus can be considered as only slightly contagious to the conjunctiva. Other organisms are mentioned, the colon, pyocyaneus and Friedlander's bacilli, the meningococcus, etc., but they are not considered important in this connection. The ultramicroscopic organisms reported by Raehlmann in trachoma, etc., require confirmation. We must still consider the organism of trachoma undiscovered.

The Pathogenic Bacteria of the Eyeball.

WEEKS, J. E., New York (*Journal A. M. A.*, August 4), enumerates the different micro-organisms that attack the eyeball, describing the lesions, points of attack, etc. Twenty-one species, he says, attack the cornea, either primarily or secondarily to infection elsewhere or in the course of a general panophthalmitis. The *Staphylococcus pathogenes aureus* is named as the most frequent bacterial agent of corneal infection, but it requires a specially favoring condition of the cornea to make it pathogenic. Among the organisms primarily affecting the cornea may be mentioned the *Bacillus ulceris cornea* of zur Nedden, which is frequently found, according to the author, in the superficial marginal ulcer so frequently seen in elderly persons. The most common fungus infection is that from *Aspergillus fumigatus.* The sclerotic is very resistant to invasion and rarely subject to ulceration. The tubercle and the tepra bacilli are mentioned as secondarily causing its infection. The principal micro organisms producing general infection of the globe are the staphylococci, *Streptococcus pyogenes,* the pneumococcus, *B. subtilis, B. coli communis, B. perfringens* and *Aspergillus fumigatus,* but infections by the four last-named species seem to be rare. The micro-organisms that affect various parts of the globe by metastasis are: Actinomycosis, pneumococcus, staphylococci, streptococcus, tubercle bacillus, typhoid bacillus and the meningococcus. Metastatic infection by the first of these, however, is not very well established. The chief infecting organisms of the iris are the bacilli of leprosy and tuberculosis, the gonococcus, pneumococcus, staphylococcus and streptococcus. Other species, primarily affecting other parts, may extend their action to the iris, but this is only a feature of the general infection of the globe. Primary invasion of the vitreous is very rare, if it ever occurs, and the lens probably suffers only through penetrating wounds. Exogenous infection of the retina may occur from any of the pathogenic organisms in other tissues and endogenous infection by way of the blood and lymph channels may also occur. Metastatic optic neuritis is the last condition noticed and the suggestion that, after infectious diseases, it may be due to toxins, is mentioned as applying to post-dipththeritic papillitis, of which the author has seen a number of cases. Localized tuberculous infection of the optic nerve without demonstrable foci elsewhere has been observed. The syphilitic infections are purposely left unconsidered in this article.

Ocular Rotations.

Savage, G. C., Nashville, Tenn. (*Journal A. M. A.*, August 4).—The mechanics of the ocular movements are discussed and their cerebral control explained. Rotation is caused by the muscles in axes corresponding to their direct pull or the resultant of their combined pull. With fewer than six muscles, rotation in all directions could not be accomplished, and more than six is not necessary. "From one to three cortical centers are excited in every ocular rotation, and only cortical centers are excited when there is but one eye. Under the control of one or other of four cortical centers the oblique muscles steady the plane of rotation (a meridional plane) so that it should bear a fixed relationship to the median and horizonal planes of the head. In doing this the obliques keep the vertical axis of the eye parallel, at all times, with the median plane of the head and compel the transverse axis to lie always in the horizontal plane of the head. This action of the obliques is in the interest of correct orientation." With equal tonicity of the ocular muscles, binocular rotation can be controlled by the cortical centers alone, but with unequal tonicity the action of basal fusion centers must be invoked to prevent diplopia. Torsion of the eyes occurs only under two conditions: When one eye is higher than the other torsion of both eyes in the same direction must occur to secure binocular vision, and in non-parallel oblique astigmatism there must be torsioning of the two eyes, but in opposite directions. The first kind of torsioning makes a horopteric plane possible; in the second kind there can be no horopteric plane, though there is binocular vision. Correction of normally set astigmatic eyes relieves the torision and makes a horopteric plane possible. The importance of normal tonicity of the ocular muscles is pointed out, as is also that of a proper conception of the location of the posterior pole of the eye and of the lines of direction as radii of retinal curvature in the teaching of the subject of ocular rotations.

Modern Ophthalmic Practice.

Valk, Francis, New York (*Journal A. M. A.*, August 18), takes issue with some ideas of Dr. G. M. Gould (A Study of Failures in Ophthalmic Practice. *Med. Rec.*, September 30, 1905) in regard to certain points. He holds that the teaching and practice of refraction is here more advanced and complete than in any other country at the present day, and that here, as elsewhere, Helmholtz's statement that "ophthalmology is by far the most accurate and scientific of all the specialties of medicine," is true. He does not share Dr. Gould's opinion that the ophthalmometer and scissors are obsolete instruments in ophthalmic practice, and, while admitting that incorrect diagnosis of ametropia is a cause of failure, he holds that it is a failing of the individual practitioner, not of the general teaching. He also disagrees with Gould as regards the question of operating for heterophoria, and objects to the designation of tenotomist as applied to those who operate to strengthen a weak muscle in cases of muscular insufficiency. In his opinion, there is no good evidence that heterophoria is refractional in its origin, or that it is due to faulty innervation. The true cause must be sought in the muscular apparatus, he states, and exercise with prisms, etc., is a poor substitute for operation that will enable the muscle to act normally. So-called sub-normal accommodation is, as Valk believes, not really the indication for glasses, but rather of a general condition that can be better treated by the family physician. In the modern practice of ophthalmology, with the use of instruments, such as the ophthalmometer and the retinoscope, we are less and less dependent on subjective symptoms, and he thinks the day may come when in refraction work the physician can make the diagnosis and properly fit glasses without consulting the patient. The scientific examination, however, should not end with the correct estimation of the refraction, but should include also the ocular motility. The more he studies the condition the more convinced he is that all imbalance is primarily and essentially due to an abnormal anatomic weakness of some one or more of the straight muscles of the orbit, and for this he advises a shortening operation. In recognizing this possibility, he states that we may reduce the number of our failures.

Conjugate Lateral Deviation.

Claiborne, J. H., New York (*Journal A. M. A.*, August 18), reports two observations of this symptom, in one of which there was an acute purulent meningitis from mastoid disease, causing a focal irritative lesion of the right inferior parietal lobe, as demonstrated at the post-mortem, thus supporting the views of Landouzy, Wernicke and Henschen as to the location of the cortical center of the lateral conjugate movements. In the other case, the symptom was a more or less constant one in a patient with a syphilitic history, and is attributed by the author to a destructive local lesion of the sixth nerve center involving only the associated lateral movements to the right, the convergence being apparently normal. The deviation to the left in this case was associated with fugacious left hemianesthesia and hemiplegia; there was no hemianopsia. The pathology of the symptom is discussed and the diagnostic points of destructive and irritative cortical and nuclear lesions, respectively, are pointed out.

Paraffin Plates in the Treatment of Symblepharon.

Wilder, W. H., Chicago (*Journal A. M. A.*, August 25), in the severer cases of symblepharon, remarks that the ideal operation implies the restoration of the fornix and mobility of the eyeball, or, if this is absent, the securing of a cul-de-sac allowing an artificial eye to be worn. While the ideal graft material cannot always be obtained, Thiersch grafts of suitable size may be employed, and he suggests as a material for holding them firmly and smoothly in place sheet lead coated with paraffin, which can be easily shaped by scissors, knife and file, with a proper opening to fit the cornea. The paraffin, of course, should be hard, with a melting point not lower than 130 F., and the grafts applied to the paraffin to which they adhere and the plate inserted into the new fornix after having been covered. The details of his technic are given. He gives his conclusions as follows: "The advantage of a plate for holding mucus or Thiersch grafts in place in the fornix of the eyelids is obvious. The advantage of the paraffin plate is that it can do no harm to the cornea. It can be built up as required to fit any conjunctival cul-de-sac that has to be lined with a Thiersch graft. The graft adheres to the paraffin, so that it can be evenly smoothed out on it, and thus perfect coaption is secured between the graft and the raw surface of the cul-de-sac. To accomplish this, the graft should be thin and large enough to cover all raw surface, no suture being required. With perfect coaption the graft will have secured a firm hold at the end of forty-eight hours and the plate can be removed for cleansing the eye. In case of restoration of the socket for prothesis, it may be left in place for a considerable time, for the sac can be cleaned by irrigation through the holes in the plate. If it is so large that there is difficulty in removing it, it can be cut in two and the subsequent treatment continued with a plate that can be more easily inserted."

Convergence and Its Defects.

Reber, Wendell, Philadelphia (*Journal American Med. Assn.*, September 1, 1906), after noticing the development of binocular vision in the animal kingdom and its importance in the evolution of the higher mental faculties, discusses the act of convergence and analyses 441 cases of exophoria, with reference to the conditions of age, sex, occupation, refractive status and types of exophoria. Details of the methods of examination and study are also given, and the treatment is discussed. The conclusions are given in substance as follows: 1. Exophoria, as a symptom-producing quantity, must be considered as an atavistic phenomenon. 2. All the advantages of binocular vision are conditioned on convergence only. 3. Convergence as daily dealt with may be said to be composed mainly of two elements—the initial or tonic convergence and the accommodative convergence. 4. The amplitude of convergence should always be calculated. 5. The average patient has between 10 and 11 meter angles of convergence. 6. The reserve amount ought to be about twice that required for work. 7-8. The cover test is the most reliable one for study of the eye when fixed on an object at twenty feet, and when converted into the parallax test it secures much added delicacy. 9. The Maddox rod and a small electric light are much better as a test for muscle balance at reading distance than the vertical diplopia test. 10. Nine-tenths of all cases of exophoria are seen in individuals over 20. 11. It is about equally frequent in both sexes. 12. Exophoria for infinity usually means deficiency in amount of convergence or in the faculty of using it. 13. Low degree exophorias are most common and most symptom producing. 14. The average degree of exophoria is least in H + Ah conditions, rises through the M + Am. conditions, and is highest in antimetropia. 15-16. There are three chief types, (a) asthenic exophoria; convergence insufficiency; (b) anatomic (sthenic) exophoria; (c) neurasthenic exophoria. About 50 per cent. of all are of the anatomic or sthenic type. 17. The muscle balance test at the reading distance is no measure of the converging power and must be supplemented by tests for the convergence near point. 18. The prism convergence is only of relative value as a working indication. 19. The relation of 3 to 1 as between prism convergence and divergence will not nearly hold in exophoria. 20. No case of functional divergence should be put down as a pure exophoria until hyperphoria of three-fourths of a degree or more has been excluded. 21. In hyperexophoria suitable vertical prisms used with convergence training will frequently do away with all the symptoms. 22. The symptoms of exophoria do not differ materially from those of other forms of eyestrain. 23. The treatment of exophoria should comprise (in the following order): (a) Right living; (b) careful refraction; (c) convergence training; (d) prisms, bases in, for infinity; (e) prisms, bases in, for the reading glasess only; (f) tenotomy or advancement.

The Surgical Treatment of Exophthalmic Goiter.

SHEPHERD, F. J., Montreal (*Journal A. M. A.*, September 1, 1906).—While surgery is admittedly contraindicated in many cases of exophthalmic goiter, the writer maintains that in a certain proportion operative measures are curative or lead to decided improvement. The probable cause is hyperactivity of the thyroid, but the part played by the thymus and other causes in this disease complex cannot be entirely ignored. Shepherd thinks that early operation is safest and that the class of cases most likely to be benefited are not the most severe ones, but those in which the gland is more enlarged on one side than on the other, with more definite tumor formation, and in which the gland is not excessively vascular and the enlargement has preceded the symptoms by years. In those early cases of enlarged thyroid with mild symptoms in which the gland is soft, vascular and evenly enlarged throughout, the results of operation are usually good. With large vascular thyroid and symptoms of marked toxemia from thyroidism operations should be avoided. He notes the disinclination of most physicians to operate and gives statistics from various operators showing good after-effects and low mortality. Nor does he consider general anesthesia as specially dangerous in selected cases. Fourteen cases of his own and three of certain of his colleagues are reported. There were three deaths, all in desperate cases, nine complete cures, three patients were much improved, one relapsed and one has been lost sight of, though improvement followed operation. Sixteen of the patients were females. In all, the operation was called for on account of distressing symptoms. The diagnoses were clinical. He does not believe the pathology of the disease is sufficiently definite to make the microscopic examination of first importance.

Incurable Eyestrain.

GOULD, G. M., Philadelphia (*Journal A. M. A.*, September 8), remarks that there is little mention in the text-books of the important class of incurable eyestrain cases, and insists on the necessity of their recognition, both for the information of the patient as to his limitations and to the physician in his management of the cases. It is bad enough, he says, that thousands of patients should be gastrologized, laryngologized, gynecologized, etc., for easily curable eyestrain, but it is far worse when the eyestrain is incurable. He includes the causes of irremediable eyestrain under the following heads: congenital anomalies; high degree of ametropia; sequels of inflammatory disease, traumatism, amblyopia or other injury of ametropia, chronic heterotropia, cerebral or neural disease; systemic disease or diseases of interrelated special organs, injurious occupations and unhygienic use of eyes. Under each of these heads the speical causes are noted. The paper is an interesting one, and full of instructive details.

Ocular Injuries from Foreign Bodies.

SWEET, W. M., Philadelphia (*Journal A. M. A.*, September 8), publishes a study of 318 cases, which are tabulated, together with a former series of 102 cases, making 420 in all. The left eye was most frequently involved (242 cases), which is assumed to be due, probably, to a greater liability to injuries on account of the position assumed by right-handed workers. Foreign bodies were located in the eyeball in 221, in the orbit in 14, in the eyelid in 3; no bodies shown by the x-ray in 182. Injuries by iron and steel numbered 356; by copper, 23; bullets or shot, 25; glass, stone or coal, 16. Operation on the eyeball for foreign bodies resulted in: Vision better than 6/30 in 37; 6/60 in 7; counting fingers or recognition of hand movements, 7; light projection, 36, and light perception, 26, with a certainty of increased vision in many of these cases on removal of the cataract; no light perception but eyeball of normal size, 6; shrunken eyeball, 11. In 67 the eyeball was lost, but in 21 of these extraction was not attempted, in 12 extraction failed, and in 34 the body was successfully removed, but the eyeball was lost later by panophthalmitis or iridocylitis. Sweet does not favor the introduction of the magnet tip into the eye when it can be avoided, believing that it increases the traumatism and tends to later worse results. When possible the extraction was made through the entrance wound; if not, through a meridional incision in the sclera close to the indicated position of the foreign body and by preference between the external and inferior recti muscles. Retinal detachment after scleral incision is, he thinks, of rare occurrence; a long-retained foreign body is much more likely to produce it. The importance of an early diagnosis in these cases is emphasized; a much better percentage of success in saving vision would be the result if in every case x-ray location of the foreign body were made and if it were extracted within a few hours of the injury. Of course, with all precautions failure may occur in some cases.

Unnecessary Blindness.

LEWIS, F. P., Buffalo (*Jour. Am. Med. Assn.*, Apr. 28, 1906) In view of the admitted fact that 40 per cent. of all cases of blindness might have been avoided by proper preventative or curative measures, and that one-quarter of this is due to ophthalmia neonatorum, an infectious, preventable and almost absolutely curable disease, the writer asks why this is so and what is the remedy. He finds the reasons for the condition in the practical neglect of the medical profession, the ignorance of the public and the indifference of the commonwealth. He would have ophthalmia neonatorum made a contagious disease, to be accurately reported, both as to its occurrence and its results. If thought necessary, an investigation should follow, and this possibility would insure the exercise of due preventive vigilance on the part of those responsible. Then he would have an authorized standard solution of the necessary silver salt prepared and distributed by the boards of health, the solutions and the accompanying card or circular prepared under the direction of a committee chosen by the President of the American Medical Association and sanctioned by its authority, and its purity and sterility vouched for by the state board of health. These solutions and circulars should be readily accessible to every accoucheur, physician or midwife, and sent out on each report of a birth, the directions sent to midwives being printed in several languages. Statistics are given showing that such measures would be really economical to the state if carried out as suggested.

Misleading Symptoms in Cerebral Disease.

STUCKY, J. A., Lexington, Ky. (*Journal A. M. A.*, April 28), reports a case of sarcoma involving the whole right tempero-sphenoidal lobe, associated with and infected by chronic suppurative ethmoiditis, and asks which was the primary lesion. No macroscopic evidence existed of disease elsewhere in the brain. The local symptoms, pain and bulging of the orbit, pointed to trouble in the right fronto-orbital region, but there was aphasia (the patient was right-handed), spasm of the right arm and hand, and the tongue deviated to the right. The author asks: Could general intracranial pressure exist without motor symptoms referable to right-sided pressure and also what would have been the result had the sinus disease been eradicated months before?

Tuberculosis of the Conjunctiva.

FERGUS, A. F., Glasgow (*The Ophthalmic Review*, February, 1906), describes a case, unique in his experience, of tuberculosis of the conjunctiva occurring in a young boy. Examination showed the presence of a tolerably large ulcer involving the palpebral conjunctiva of the upper lid. This was surrounded by numerous sprouting granulations, which were in large part covered by small bodies closely resembling miliary tubercles. There was enlargement of the preauricular gland and of a gland behind the ascending ramus of the inferior maxilla on the same side as the affected lid. The ulcer was about four millimeters long and involved only the conjunctiva of the upper lid and slightly that of the retrotarsal fold. The bulbar conjunctiva had escaped entirely. The pathologic examination revealed the presence of tubercle bacilli and the features characteristic of tuberculous ulceration. Thorough excision of the diseased area was performed.

S. H. B.

Bacteriology of Serpent Ulcer.

McNobb, H. H., Manchester (*The Ophthalmic Review*, March, 1906), made a study of the bacteriology of twenty-five cases of serpent ulcer of the cornea with hypopion and tabulates his findings as follows:

Organism.	*Ulcer.*	*Conjunctiva.*
Fraenkel's pneumococcus	16 times	11 times
Bacillus xerosis	9 times	13 times
Staphylococcus pyogenes albus	3 times	4 times
Staphylococcus pyogenes aureus	2 times	3 times
Streptococcus pyogenes longus	0 times	1 time
Diplococcus ? nature	1 time	1 time
No growth	2 times	0 times

In the treatment of serpent ulcer, he employs an antiseptic method (perchlorid of mercury solution 1:5000 and without iodoform) and slit up the lacrymal canal in every case, injecting with a pipette a few drops of 25 per cent. solution of argyrol into the lacrymal sac daily. This is usually combined with atropin and hot bathing of the eye. If the ulcer shows a marked tendency to spread, the thermo-cautery is applied, and if the hypopion increases in spite of other treatment an inferior section at the periphery of the cornea is performed. Whenever possible open-air treatment is adopted. S. H. B.

Lid-Closure Pupil Reflex.

Ballantyne, A. J., Glasgow (*The Ophthalmoscope*, February, 1906), relates the histories of two cases of this interesting condition recently coming under his observation. The first patient, a poorly nourished girl of 17 years, was suffering from a moderately severe attack of chorea affecting the muscles of the face and limbs of the right side of three months' duration. There was a history of acute articular rheumatism and of a fright. The onset of the condition was gradual. When first observed the chorea was marked and there was occasional involvement of the orbicularis muscle on both sides. Nutral cardiac disease was present. During the early stage, the patient showed some intolerance of light, for example, when light was focused upon the eye with the object of testing the light reflex, it caused a spasmodic closure of the lids. At these times it was noticed that on opening the eyes again the pupils were for an instant smaller than they had been before the closure and took an appreciable time to dilate to their normal size, instead of, as under normal conditions, contracting shortly after exposure to light.

The second case was also observed in a young woman suffering from convulsive attacks, apparently of a functional nature, affecting the muscles supplied by the ninth, tenth, eleventh and twelfth nerves. The reflex in this case was well marked. Ballantyne does not ascribe any diagnostic value to the reflex. S. H. B.

Blanching of Eyelashes in Interstitial Keratitis.

STEPHENSON, SIDNEY, London (*The Ophthalmoscope*, February, 1906), presents in detail the clinical history of a case of interstitial keratitis in which the eyelashes became white during the course of the disease. The patient was a syphilitic and the interstitial keratitis presented no other striking features. Stephenson states that this is by no means the first case in which this has been observed and gives references to the other recorded instances of it. S. H. B.

Birdshot Injuries of Eye.

MARPLE, W. P., New York City (*Journal A. M. A.*, August 11), reports two cases of birdshot injuries of the eye, both cases of double perforation. In one of them enucleation was practiced. In the second case the shot were located by the x-rays. He discusses the diagnosis and prognosis of these injuries and refers to a number of cases of interest in the literature. Except when there is a lacerated wound in the ciliary region, or when the eyeball is disorganized by numerous shot entering it at close range, he considers the prospect of saving the eyeball generally fair so far as the sight is concerned, that depends on the parts involved. If the course of the shot is through the peripheral structures, and especially when there is a double perforation, the visual disturbance is principally due to hemorrhage and it may take months for absorption to be complete. Penetration of the eyeball is not an essential condition for serious results; they may occur without it. In his second case, the vision was 20/20 at the end of five months, and absorption, he thinks, was still continuing. When shot remain in the eye it may do mischief if it rests near the ciliary body, but he does not consider that its mere presence will be necessarily irritating. If the shot is in an accessible position, attempt should be made to get it out, as when it lies near the ciliary body, where it will probably set up irritation. Otherwise it may become encapsulated, as is often the case. If the eye is badly lacerated immediate enucleation is advisable. If the perforation is single the principal thing is to prevent infection. Accurate x-ray pictures should be taken to locate the shot, and, if a double perforation is shown, the eye can probably be saved, if the ciliary body is not injured and if infection does not occur. Probing is strongly condemned. With hemorrhage in the vitreous the iodides may be useful in assisting absorption.

A Lecture on the Art of Extracting for Cataract.

TAYLOR, C. BELL, M. D. (*Ophthalmoscope*, May, 1906), after describing Waldau's incision, states that he attains the same result by employing one or the other of two knives of his own design in preference to the broad keratome used by Waldau.

As to the modus operandi, Taylor separates the lids with a light speculum, steadies the ball with Critchett's forceps, and enters the knife in the cornea close to the sclerotic, making a flap in the usual way, consisting of about one-half the cornea.

A wide laceration of the capsule is next in order, followed by slight pressure at the lower border of the cornea, or a turning down of the eyeball.

Taylor states that "if all has gone well," loose cortex, prolapse of ris, etc., will be absent.

In operating, he stands behind the patient, who reclines, and almost invariably uses artificial illumination, which, judging from the accompanying illustration, is an old-fashioned oil lamp, the hot air from whose chimney is considered an excellent sterilizer by Taylor. The knives, curettes and forceps are sterilized by dipping for a "moment" in absolute alcohol, whilst the patient's face, lids and cilia are sponged with the same solution.

For anesthesia, holocain and cocain usually answer, but where the patient is unruly nebulized ether is employed, the operation being started in the first stage.

Simple extractión is preferred, and, when prolapse occurs, Taylor states that it is capable of self-cure. He formerly prevented it by excising a small piece of the sphincter, or limiting the iridectomy to the periphery of the iris. F. C. P.

Notes on Cataract Extraction.

Maddox, Ernest E. (*Ophthalmoscope,* May, 1906), considers atropin, instilled at the close of an operation, to be of great value in cases predisposed to iritis or gouty iridocyolitis.

In unruly patients, or those subject to coughing or sneezing, suturing the wound appeals to him.

If the conjunctiva is suspicious, a saltspoonful of finely powdered boric acid over the inner canthus is part of his routine. This is covered with moist lint, over which is placed gutta percha tissue. The virtue of boric acid lies in its solubility in contradistinction to Haab's method of using iodoform in the same way.

Simple extraction or a preliminary iridectomy is preferred, the combined operation being avoided when possible.

A tongue-shaped flap attached by not more than one-third of the cornea is considered best.

Maddox, in closing, states that "vis a tergo" should be used until the lens is half way out, after which "vis a fronte" is in order, the latter being rather uncertain, as no perfect means are at his command to accomplish this. F. C. P.

A Case of Gumma of the Iris and Ciliary Body.

Smith, Stanley, M. D. (*Ophthalmoscope,* May, 1906), reports one of Dr. Oliver's Wills' Hospital patients, who presented himself with a syphilitic iritis, infection having occurred three months previously. No secondary symptoms were demonstrable.

The usual specific treatment was administered. Rapid improvement followed, the vision rising from one-eighth of normal to normal in one week's time. The gumma appeared at the end of the second week. At the termination of the third week, vision was lowered to one-hundredth of normal by a round-cell infiltration.

The gumma increased to the size of a pea until at the close of the fifth week subnormal tension, which had been present, rose to normal, and improvement set in. The patient, however, was lost sight of at this stage, with the eye in a promising condition. F. C. P.

Epithelial Plaque of Cornea.

Doyne, R. W., M. A., F. R. C. S., and Stephenson, S., M. B., F. R. C. S. E. (*Ophthalmoscope,* May, 1906), report a case, age 27 years, and in their remarks state that the patient in all probability had had ophthalmia neonatorum. The "curious patch on the left cornea is, without doubt, an example of an 'epithelial plaque' (Hocquard), or 'secondary xeroiss' (Leber)."

They state that the condition is rare, and is found only in blind or partially blind eyes. Demarres first described it in 1855, as "plaques écailleuses cornées," being followed a few years later by the report of a bilateral case by Warlmont.

E. Hocquard reported two such cases in 1881 under the name "plaques épithéliales de la cornée." Shortly after this Leber described several similar cases which he termed "secondary xerosis." Stephenson mentioned the condition a few years ago in a communication upon "Epithelial Xerosis."

F. C. P.

A Minute Cerebral Lesion.

Percival, A. S., M. B. (*Ophthalmoscope*, May, 1906), reports a case in which the right eye was fixed in the median line, suggesting paralysis of the right internal rectus, but which was not the case as proved by the perfect converging powers.

Slight ptosis of the left eyelid was present, the pupil moderately dilated and sluggish. Upon rotation to the left, nystagmic movements occurred in the left eye. Diplopia to the left accompanied. No specific history was elicited.

'Percival localizes the lesion as being situated at the junction of the fibres transmitting impulses from the cortical centre in the right hemisphere to the sixth nucleus and thence to the anterior part of the right third nerve nucleus, with the third nucleus.

As the nystagmus disappeared upon closure of the right eye, it was shown to be a compensatory action due to efforts in controlling the diplopia. F. C. P.

Regulation of Color Signals in Marine and Naval Service.

Oliver, Charles A., (*Ophthalmoscope*, June, 1906), in his preliminary remarks, states that as long as colours are employed in signalling, especially on water where conditions are variable, the colour material as well as the signalling apparatus, should be continually improved as to efficiency and simplicity.

The colours now employed are the coarser ones—red, green, yellow, white and blue. Colours are used from the fact that they are more stable and better appreciated by the eye than moving objects of different shapes. Oliver advises the following as being his ideal:

1. All colours should be uniform in tint for use by reflected or transmitted light, and should be proven correct by com-

parison to standards chosen by an "International Commission of normal-eyed colour experts."

2. Samples of colour-boxes, colour-lamps, signal-colours, etc., should be placed upon every vessel, and employed as standards—these latter to be certified.

3. The nation, state or municipal government should periodically inspect all colour materials and furnish a certificate, together with proper instructions for preserving the colours in their original brilliancy, and also the easiest method of manufacturing, as well as clearly-expressed rules for use at different distances.

4. Each series of related colours should be regulated as to their size and colour saturation.

In conclusion Oliver advises making the colour-areas relative in size, which procedure he considers of the greatest importance, as, for example, to make a red and green light of equal intensity at a given distance, the green would have to be illuminated five times as more powerfully or enlarged five times the size of the red. F. C. P.

Extraction of Cataract Under Various Constitutional Conditions.

Drake-Brockman, E. F., F. R. C. S., (*Ophthalmascope*, June, 1906), gives his clinical results of the above as follows:

1. Constitutional syphilis, 94.73 per cent., one failure.
2. Aneamia, 93.93 per cent., two failures.
3. Valvular disease, 93.55 per cent., two failures.
4. Albuminuria, 93.33 per cent., one failure.
5. Elephantiasis, 93.33 per cent., two failures.
6. Diabetes, 86.84 per cent., five failures
7. Varicose veins, 6 cases—all successful.
8. Leprosy, four cases, successful.
9. Opium Eaters, three cases, successful.
10. Ovarian disease, one case, successful.
11. Pregnancy, two cases, (no statement to the effect, but apparently successful.) F. C. P.

A Clinical Note Upon Clefts in Decemet's Membrane.

Stephenson, Sydney, (*Ophthalmoscope*, June 1906), states that these defects have been found in distended eyeballs, such as buphthalmus, keratoconus, intraocular tumors and progressive myopia. He cites two cases. The first patient presented "about a dozen double-contoured, grayish lines..*..*..lying somewhat obliquely in the cornea, more especially in its nasal half." These lines were more or less parallel and stood at an angle of 15 deg. inwards from the perpendicular. They are likened to flaws in glass. They were of a less diameter than that of the cornea and were situated near the posterior surface.

The refraction of —10.50SↃ—12.50 C Ax. 105° improved vision only to fingers at one meter. The left eye showed no similar changes.

The corneæ of the second patient—a girl six years of age—were globular with a diameter transversely, of 14 mm. There was a Y-shaped, hazy figure present, whose prongs contained faint punctate opacities. The discs were cupped and tension was increased. The anterior chambers were deep. Anti-syphilitics and myotics, together with upward iridectomy, prevented further enlargement of the eyeballs.

At first examination the child showed symptoms of congenital syphilis. F. C. P.

A Case of Suppression of Aqueous Secretion.

LLOYD-OWEN, M. D., F. R. C. S. I., (*Ophthalmoscope*, August, 1906.), reports the following case, man, æt. 40 complaining of blurring and slight soreness on top of O. D. Examination showed a slight dilitation of the conjunctival veins and a lustreless cornea. The anterior chamber was very shallow but the pupil was normal. Pressure upon the equatorial region elicited tenderness and sudden movements of the globe caused subjective light sensations. Tension was — 2. Refraction, — 2.50, giving 6/6 vision. O. S. normal.

Treatment consisted of pilocarpine, dionine and atropine, but produced little effect upon the depth of the anterior chamber or tension of the globe.

One month after the onset of the symptoms, the sight suddenly cleared up, but again resumed its abnormal condition in a few hours, to be followed in a week's time by another improvement in vision. At this time the anterior chamber was normal, refraction emmetropic and the cornea bright and clear. Tension was also normal.

A relapse occurred four days later and lasted three days, after which the eye remained normal for a fortnight. Another relapse lasting three days was followed by recovery lasting a month, whilst still another relapse of two days was succeeded by peramnent restoration of normal functions.

During each attack the anterior chamber would be shallow, and correcting lenses were necessary to obtain normal vision, while during the interval between the phenomena, the chamber regained its normal depth, and correcting lenses were dispensed with.

In conclusion Lloyd-Owen states that a careful examination failed to reveal any abnormalities other than those mentioned.

F. C. P.

The Morax-Axenfeld Diplobacillus.

Brown, Pusey, Chicago (*Journal A. M. A.*, July 28), reports 10 cases of infection by this pathogenic organism, showing the range of its effects from nothing up to serious corneal ulcer. He thinks that, considering its importance, it has not received the recognition in this country that it deserves, and this is the more unfortunate since we have a specific remedy for it in zinc. While emphasizing its importance as a factor of danger for the cornea, its effects on the conjunctiva also should not be underestimated. The alleged possibility of a deposit of zinc from the prolonged use of zinc solution in corneal ulcers is mentioned, but in his case he employed it every three hours for three weeks, and three times daily for another three weeks without observing any such effect.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY WILLIAM T. SHOEMAKER, M. D.,
PHILADELPHIA.

A. C. SAUTTER, M. D.,
PHILADELPHIA.

WALDEMAR E. FISCHER, M. D.,
SAINT LOUIS.

AND

CLARENCE LOEB, M. D.,
SAINT LOUIS.

A Binocular Pupildometer.

OHM, JOH. (*Centralbl. f. prakt. Augenheilk.*, May, 1906), refers to the different methods in use for determining the diameter of the pupil, and describes an apparatus designed by him for the purpose of measuring and comparing the pupils. The instrument consists of three parts—a mirror part, a measuring part and a head rest. It would take too much space to describe the construction of the apparatus, which can be obtained from Doiffel and Farber, Berlin. C. LOEB.

A Case of Pseudolucemic Tumor of the Orbit.

SEELIGSOHN, W. (*Centralbl. f. Prakt. Angenheilk.*, June, 1906), reports in detail a very interesting case. A girl, 21 years of age, after an attack of angino, suffered from anorexia, fever, rapid pulse, malaise, rheumatic pains in muscles, swelling of joints and acute nephritis. This was followed by severe headache, bilateral choked discs, cyclitis, swelling of lids and exophthalmus; at the end of the seventeenth week tumors were observed between the margo supraorbitalis and the ball. Later there was a transient enlargement of the liver. The blood examination showed a slight increase of lymphocytes. Under administration of arsenic, the patient had very much improved. The condition was probably a septic infection, via the tonsils, whose unusual course was due to the impaired resistance of the patient. C. LOEB.

Recognition of Sarcoma of the Choroid.

PURTSCHER, G. (*Centralbl. f. Prakt. Augenheilk.*, May, 1906), reports a case where the differential diagnosis between glaucoma and sarcoma of the Choroid was made by means of paracentesis of the cornea. The fluid was thick, and, under the microscope, showed blood corpuscles and a large amount of brown masses of pigment such as are found in sarcoma of the Choroid. There were, however, no cells enclosing pigment. The eye was enucleated and there was found a sarcoma of the Choroid lying in the posterior part of the eyeball, in the region around the disc. C. LOEB.

Stasis-Hypermia in Ophthalmology.

HESSE, ROBERT (*Centralbl. f. Prakt. Augenheilk.*, June, 1906), makes a preliminary report as to the value of an artificially produced hyperemia in diseases of the eye. The instrument used is a glass cup, which is adapted to the eye and vicinity. To this is attached a rubber tube, which ends in a bulb or suction pump. The pressure exerted thereby is from 20-50 mm. of mercury—a greater amount may produce hemorrhage from rupture of the conjunctival vessels. The apparatus may be used with closed lids, in which case the ball is only slightly affected, or with open lids, when the eye takes part in the Hyperemia. The author reports favorable action by this method. C. LOEB.

Connective Tissue Formation on the Posterior Corneal Surface.

BARTELS (*Klinische Monatsblatter fur Augenheilkunde*, July, 1905).—Bartels reports the histological examinations of four cases in which there was new tissue formation on the posterior surface of the cornea. In three cases there had been corneal ulceration with perforation; in the other, iridocyclitis without perforation. The anatomical findings and staining peculiarities of the new formation resembled connective tissue. In the three former cases the superposed layers contained few nucleii; in the latter, two layers were discernible, a denser one next Descemet's membrane, and sharply separated from it another layer posteriorly more rich in nucleii. Wagermann and Greeff have shown that similar conditions can arise from a proliferation of the corneal endothelium. Unthoff and Axenfold also held this view, pointing out the close similarity between such tissue formations and proliferated endothelial cells seen in the organization of thrombi. Krukmann considers the endothelial cells undeveloped connective tissue cells.

Bartels was unable to discover any endothelial relation. He therefore believes the organization of exudate, and the transformation of its cellular constituents into connective tissue elements a more satisfactory explanation of the cases under discussion. In this connection he refers to posterior corneal opacities, the sequelæ of interstitial keratitis or hypopyon. While in such instances the resorption of exudate is usually complete, organization can take place, resulting in posterior corneal opacities, clinically ofttimes confused with intracorneal opacities. Peripheral anterior synechiæ due to organization of exudate in the angle of the anterior chamber also tend to uphold this theory. A. C. S.

The Infection of Corneal Wounds With Sputum.

HOTTA (*Klinische Monatsblatter fur Augenheilkunde,* Sept. 1905).—In spite of the many opportunities always present inviting corneal wound infection with micro-organisms contained in the sputum, Hotta shows that these infections are only liable to occur under certain conditions.

Experimental inoculation of corneal wounds with normal human sputum showed that only non-penetrating flap-shaped wounds of the cornea could be successfully infected. Perforating wounds and corneal erosions were practically exempt from infection; the escape of the aqueous, the rapid closure of the perforating wound edges, and above all the mechanical action of the increased lacrimal secretion, Hotta considers detrimental to bacterial invasion. Pneumococci, streptococci and staphylococci in the order named were the most frequent organisms found giving rise to corneal infection.

Infection of operative corneal wounds with sputum are bound to be infrequent as most of these are either perforating or superficial scratch wounds. The small operative field exposed and the comparatively short duration of the average operation also contribute largely to the few infections originating from this source.

Estimating the number of primary infections complicating cataract extractions to be 5 per cent. and the majority of these traceable to conjunctiva micro-organisms previously present, the possible number of infections due to sputum alone must be extremely small.

Under ordinary conditions, therefore, Hotta sees no advantage in adopting measures providing against any such infections. A. C. S.

Concerning the Prevention of Ophthalmia by Sophol.

HERFF, V. (*Munchener medizinische Wochenschrift,* May 15, 1906).—v. Herff is convinced of the good results achieved since the introduction of silver nitrate as a means of preventing ophthalmia in the new born, but he considers some of the silver preparations which have recently come in vogue as equally efficacious and less irritating.

Three thousand and nine cases subjected to 10 per cent. protargol at the Woman's Hospital Basel-Stadt, were followed by only two late infections, not one early infection occurring.

The disadvantages of protargol are the difficulties met with in preparing solutions and its slightly irritant action on the conjunctiva. Argyrol in his hands has proven still less irritating, but the small amount of silver it contains and other less important reasons have encouraged the author to try sophol or silver formo-muclein.

Experiments conducted by v. Herff on the human eye to determine what dilution a series of silver preparations must possess to be free from any irritating influences, gave the following results:

Siver Nitrate (63.5 per cent Ag.)	.025	per cent.
Protargol (8 per tent Ag.)	4.	per cent.
Sophol (22 per cent Ag.)	9.1	per cent.

Stronger solutions than these are more or less irritating. Comparing these findings in relation to the amount of combined silver with the above mentioned .025 per cent. silver nitrate solution, he finds that sophol contains almost seventy times as much, and protargol about twelve times as much silver as the strongest non-irritating solution of silver nitrate.

Solutions of protargol, sophol and argyrol each containing .08 per cent Ag. were then mixed with bouillon cultures of staphylococcus pyogenes aureus. Protargol and sophol caused bacterial death in 5¾ hours, argyrol in 48 hours. The action on the bacillus pyocyanocus was almost identical.

Solutions of protargol 1-500, 1-1000, and 1-2000; sophol 1-1375, 1-2750, and 1-5500; and of argyrol 1-1250 completely checked the growth of the staphylococcus aureus, and the bacillus pyocyanocus.

v. Herff cites 1,200 cases in which sophol (5 and 10 per cent.) was tried; but one early infaction occurred, and that in a case subjected to a 10 per cent sophol solution. In 500 cases argyrol was used, no infections resulting. Adding the 3,009 cases treated by protargol of the above number, altogether 4,700 infants were treated at the Woman's Hospital, Basel-Stadt, resulting in .06 per cent. infections, which compares favorably with the .2 per cent. infections which occurred after the use of silver nitrate in the same institution. A. C. S.

Inflammatory Conditions of the Eye in the Newborn and One Per Cent. Silver Nitrate Solution.

LEOPOLD (*Munchener Medisinische Wochenschrift,* May 1, 1906).—The author at one time strongly advocating a 2 per cent. solution of silver nitrate (Crede's Method) as a certain prophylactic measure against gonorrheal ophthalmia in the newborn, now favors a 1 per cent. solution. Unlike Cramer, who condemns Crede's method as being much too vigorous, often leading to troublesome inflammatory reactions, Leopold professes to have had excellent results by this method, at the same time, however, acknowledging an occasional conjunctival irritation not often encountered after the administration of a 1 per cent. solution.

In the Dresden Woman's Hospital from 1902-1905 inclusive, 7,287 infants were treated with a 1 per cent. solution, resulting in only five early infections (symptoms arising before the fifth day) and thirteen late infections. All the early cases Leopold traces to faulty technique on the part of unskilled nurses and doctors. The late infections almost without exception were produced by soiled hands of the mother coming in contact with the child's eyes. In spite of stringent prophylaxis in this direction such infections are difficult to prevent; early infections, however, Leopold thinks should not occur if the Crede method of instillation is conscientiously followed.

Bilateral Retinal Detachment With Increased Intraocular Tension in a Case of Albuminuric Retinitis of Pregnancy.

SCHERENBERG (*Klinische Monatsblatter fur Augenheilkunde,* July, 1905).—The clinical history and ocular histological findings in a case of albuminuric retinitis of pregnancy are published by Scherenberg. The retinal detachment in both eyes was nearly complete. Between the retina and the chorioid he found a grayish-yellow exudate, the retina itself being thickened besides showing a peculiar cavity formation. The vessels of the entire uveal tract, and to a less extent those of the retina, showed signs of degeneration, and thrombosis was widespread. There was no disease of the vitreous, and no retinal tear was manifest.

Scherenberg believes the vascular degeneration, and especially the thrombotic complications, to have favored the subretinal exudation. That such exudations can produce detachments is now beyond dispute. The increase of intraocular tension he attributes to a sudden transudation from the chorioid without a corresponding absorption of vitreous, the vascular lesions no doubt prohibiting an adequate withdrawal of vitreous. In Yamaschita's and Kunz's cases of detached retina complicating albuminuric retinitis there were degenerations of the retinal and chorioidal vessels. The former cases also were characterized by increase of tension. Increased intraocular tension without detachment has been described by Weberli; there was also obliteration of the anterior chamber and the symptoms resembled glaucoma.

Scherenberg's case has a clinical interest on account of the occurrence of the affection in a multipara, and on account of its rapid fatal termination. Abortion, because of the advanced pregnancy and the otherwise hopeful condition of the patient, was not performed until uræmic symptoms presented.

Although this form of albuminuric retinitis is generally regarded prognostically as more favorable than ordinary albuminuric retinitis, Scherenberg is inclined to consider it a grave complication, and in all such cases he believes the interruption of pregnancy at the earliest possible period the only safe course to pursue. A. C. S.

Concerning Isolated Ruptures of Decemet's Membrane.

AXENFELD (*Klinische Monatsblatter fur Augenheilkunde*, August, 1905).

1. *Folds and Ruptures of Decemet's membrane in megalocornea* (absortive hydrophthalmus).

Haab regards these as important symptoms of hydrophthalma, differentiating it from megalocornea. Reis, who in an elaborate treatise described the morbid anatomy and pathogenesis of hydrophthalmus congenitus, believes the condition of megalocornea to be nothing more than an abortive form of hydrophthalmus. Axenfeld, prior to Reis' publication, observed tears and folds of Decemet's membrane in a case of true megalocornea, glaucomatous symptoms being entirely absent. These folds and tears were extremely delicate and could only be satisfactorily studied with the binocular loupe. Inasmuch as changes such as these, which naturally imply a stretching of the cornea, are the conditions generally met with in hydrophthalmus, Axenfeld sees much in favor of classifying all cases of megalocornea as abortive types of hydrophthalmus.

II. *Acute exacerbations of keratoconus due to spontaneous ruptures of Decemet's membrane.*

In 1898 Axenfeld studied a case of keratoconus complicated with acute corneal symptoms. Although suspecting a spontaneous rupture of Decemet's membranè, he was unable at that time to verify it. He now reports a similar case. The corneal symptoms appeared suddenly. There was increased conus protrusion. The overlying corneal surface was stippled and had an intense grayish-white appearance. The apex was indented with difficulty. Under local therapeutic measures the inflammatory symptoms gradually subsided. The patient then left the hospital, and it was not until one year later that Axenfeld had the opportunity to again examine the ocular condition. With the Zeiss binocular loupe the following conditions were noted. The corneal epithelium had regained its lustre. The apical portion of the corneal parenchyma revealed several irregularly concentric striated opacities, behind which were discernible two very fine tears of Decemet's membrane enclosing a lancet shaped area, Axenfeld does not believe that these have any relation to the initial stages of the disease, having been unable to find them as yet in beginning keratoconus. That lesions of the endothelium alone can produce similar exacerbations he considers possible, but the process is a much more gradual one. To obtain a better understanding of the disease he encourages the use of Zeiss and Zehender-Westien binocular loupes in every case of keratoconus. A. C. S.

Cataract in Tetany. Diabetic and Senile Cataract.

Pineles (*Weiner klinische Wochenschrift,* June 7, 1906).—Comparing the tetany in animals after thyroidectomy and the removal of the parathyroids with tetany strumiprivus and other varieties of tetany observed in man, Pineles clinically finds much in common; the nervous manifestations so characteristic of human tetany appearing in almost every case. Accordingly Pineles believes the pathogenic factors underlying all types of human tetany to be intimately related to one another.

Tetany strumiprivus having been proven beyond doubt to be due to an absence of the parathyroids, he considers all forms of human tetany to be the result of a supposed internal poison originating from a parathyroid deficiency. In support of this theory he discusses the trophic disturbances, and in particular the lenticular which at times complicate the disease.

Having shown that in almost every form of tetany (strumiprivus, pregnancy, laborer's, infantile) cataract has been observed, he concludes that the pathogenic connection between all varieties of tetany must be necessarily a close one. The infrequent occurrence of gastric tetany and the usually rapid fatal course of the primary ailment may account for the fact that cataract has never been reported in this form of tetany. In the other various types cataract has been noted so often that all cases of premature cataract should be investigated for symptoms of tetany. That the cataract results from convulsive seizures causing a shaking of the lens substance, or from repeated cramps of the ciliary muscle cannot be substantiated. The few cases of epilepsy and hysteria reported complicated with cataract are not conclusive evidence, these cases being much too rare in combination with diseases which are extremely common. The ciliary muscle spasms always absent in infantile tetany are often wanting in the adult type. Furthermore, Peters has never been able to produce cataract in animals by protracted instillations of eserine.

The rare association of struma and thyroid insufficiency with lenticular changes and the relatively frequent combinations of tetany with cataract leads Pineles to believe that both cataract and tetany are the result of loss of the parathyroid function, a liberated internal poison then asserting itself which acts directly on structures octodermic in origin. Erdheim has shown that after the removal of these bodies in rats, lenticular opacities resulted.

Pineles attributes diabetic cataract to a similar derangement of the internal secretory apparatus (pancreas, thyroid, suprarenals), the close connection between glycosuria and these structures being well established.

Considering senile cataract from this standpoint he is inclined to ascribe the cause to similar conditions, referring to the diminution of the sexual function as one of the most conspicuous signs of senility, and a symptom not uncommon in acromegaly, exophthalmic goitre, cretinism, myxedema and diabetes. A. C. S.

A Case of Unilateral Retrobulbar Neuritis in Recurring Empyema of the Antrum. The Relation of Nasal Disease to Ocular Affections.

Pihl (*Klinische Monatsblatter fur Augenheilkunde,* July, 1905).—Pihl reports the history of a case of one-sided retrobulbar neuritis in which radical treatment of the associated antrum disease resulted in a repression of the ocular symptoms, and eventually in a return to normal vision. Reviewing the anatomy of the orbit in its relation to the accessory sinuses he shows how anatomical peculiarities (thin bony partitions, foramina, fissures, congenital defects, etc.) predispose to disease from without.

That sinus involvement secondary to nasal affections is responsible for many cases of unilateral retrobulbar neuritis is a well-known fact. To this class also belongs that form of optic neuritis caused by exposure to cold, "Erkaltungs neuritis," also serous or rheumatic tenonitis. Orbital cellulitis and orbital phlegmon, too, are not uncommon complications of empyema of the sinuses. In all such cases the usual means of entrance into the orbit is directly through the orbital walls.

Exudates and neoplasms of the sinuses may lead to mechanical derangement of the orbital contents. Intraocular sequelæ other than inflammation of the optic nerve usually affect the uveal tract, are generally suppurative in character and probably most often metastatic manifestations.

The wide and intercommunicating vascular and lymphatic systems of the nose and orbit permit of another mode of "internal" orbital invasion. Thus furuncles of the nasal vestibule may give rise to orbital phlebitis and thrombosis of the cavernus sinus; nasal obstructions to edema of the lids, chronic hyperemia of the conjunctiva and transient pericorneal injection. Ecchymosis of the bulbar conjunctiva, and rarely intraocular hemorrhage have followed violent sneezing or coughing. Ocular reflexes dependent upon nasal disturbances are every day occurrences.

The nasal duct supplies the external connection between the nose and the eye.

Pihl believes the infrequency of descending infections to be due to the more resistant ciliated nasal epithelium. The pavement epithelium of the bulbar conjunctiva and canaliculi is again less vulnerable than the thin columnar epithelium of the tarsus. The constant downward flow of lacrimal secretion assists in the prevention of infection of the nasal duct from above.

Ascending infections, however, are more readily produced by an extension of the inflammation of the nasal mucosa upward to its epithelial continuation—the nasal duct. The subsequent edema leads to constriction of the duct lumen and lacrimal stagnation, thus affording bacteria an easy means of ascent. A. C. S.

Symmetrical Gangrene of the Eyelids Following An Injury to the Frontal Region.

APETZ (*Minchener medizinische Wochenschrift*, May 8, 1905).—Apetz reports a case of this kind occurring in a child one and a half years old. The lid symptoms revealed themselves several days after the infliction of a trivial lesion situated in the frontal region, a wound then apparently well closed and without undue irritation. The symptoms included edematous swelling and discoloration of both pairs of eyelids, followed by gangrene with exposure of the orbicularis, only a narrow zone adjoining the free lid edges escaping, due, Apetz believes, to the firm attachment of the skin at this point to the underlying structures. Several abscesses near the glabella had to be incised and drained. There was moderate conjunctival irritation, but both eyeballs remained intact. The disease terminated favorably; the necrotic tissue was replaced by healthy granulations, and at the end of two months nothing more than a few broad radiating cicatrices loosely adhering to the subjacent structures could be demonstrated. There was no ectropion or trichiasis. Streptocci in pure culture were found in the diseased tissue and in the pus collections.

Though cases of symmetrical gangrene following infectious diseases have been described by several authors there is only one case of traumatic origin on record, a case reported by Burnett of complete purulent gangrene not only of the lids, but of the conjunctiva and eyeballs. Cases of traumatic gangrene involving the lids of only one eye have been reported by St. Martin, Moras, Schillinger and Pes.

Apetz believes the case of spontaneous gangrene reported by Hilbert to resemble his own, the external lesion in that instance being so inconspicuous as to elude observation. The symmetrical nature of the disease he attributes to the early invasion of the glabellar region, from which by lymphatic channels both sides subsequently became affected. A. C. S.

Interstitial Keratitis Produced in the Rabbit by Inoculation of Syphilitic Virus.

SCHERBER (*Munchener medizinische Wochenschrift,* June 14, 1906. Preliminary Report).—Both Siegel and Schultze have demonstrated the possibility of inoculating rabbits with the virus of syphilis, using the iris as a site for such inoculations. Inoculations in these instances were followed by the appearance of characteristic local lesions, and later by constitutional manifestations clinically much like those of a generalized syphilitic infection in man.

To verify these conclusions, Scherber and v. Benedek introduced virus obtained from chancres, syphilitic glands and pauples into the anterior chamber of a number of rabbits. The presence of the specific infection was proven (excepting the infectious material obtained from the papule) by cover glass preparations, and by inoculation in monkeys.

In one or two weeks grayish-yellow nodules situated in the iris near the pupillary margin were noted, remaining stationary for four weeks when they gradually disappeared. The cornea remained clear until the sixth week, when, without any marked inflammatory reaction, an interstitial keratitis supervened with the subsequent formation of deep vessels in the corneal tissue. Histological study of one case justified the diagnosis keratitis, similar in many respects to that condition observed in men, a condition which, according to Elschnig, has never been experimentally produced.

The spirochæte pallida could not be found in sections, probably because the specimens were sectioned too late.

Portions of the cornea, ciliary body and iris of a rabbit with a pronounced type of interstitial keratitis inoculated into the supraorbital region of a monkey was followed four weeks later by the appearance of a copper colored, well circumscribed infiltrate.

A few control experiments with non-luetic infectious agents have so far given negative results. A. C. S.

Sclerosis of the Cornea.

MELLER (*Klinische Monatsblatter fur Augenheilkunde*, September, 1905).—Meller applies this term to a condition occasionally observed in the corneas of blind degenerated eyes, characterizing itself by a general diffuse sclera-like opacity. The surface of the cornea is often smooth and brilliant and vessles are scarce. The equal diffusion of the opacity renders a true estimate as to its location difficult. In these respects it differs from those degenerations in which Bowman's membrane is chiefly concerned. Meller publishes the microscopical findings in two cases of sclerosis of the cornea. In one the opacity was found to be due to a layer of connective tissue in front of Bowman's membrane. This he believes to be originated as graunlation tissue from the limbus, and later to have become converted into connective tissue. While this condition was most marked in front of Bowman's membrane, the continuity of the latter was broken in several places, permitting a slight invasion of the corneal parenchyma. Baas describes this condition as "pannus degenerativus."

In the other eye there was an edematous swelling and vacuolation of the cornea; the corneal lamellæ had become separated, the fibrillæ being demonstrable as tortuous filaments with delicate striations. The anterior corneal layers were normal, the posterior structures on the other hand, especially the endothelium, showed degenerative changes. The generalized opacity, Meller ascribes to a defect in the endothelium allowing the gradual infiltration of aqueous humor between the corneal lamellæ. According to Leber, the integrity of the endothelium is essential to the preservation of the transparency of the cornea.

Inequalities of the corneal surface, changes of the epithelium, vesicle formation, etc., favor a diagnosis of "pannus degenerativus." When these are wanting the sclerosis most probably is brought about by disturbances affecting the posterior layers of the cornea. A. C. S.

A Case of Hereditary Optic Neuritis (Leber) of Legal Interest.

HANKE (*Klinische Monatsblatter fur Augenheilkunde,* June, 1905).—At the Düsseldorf Congress, 1905, it was generally conceded that inflammatory ocular conditions depending upon constitutional taints could be precipitated by traumatism, particular reference being made at the time to interstitial keratitis following traumatism. Further evidence is furnished by Hanke, who reports acute retrobulbar neuritis in a young man, a steam-kettle cleaner by occupation, who frequently exposed himself to sudden marked temperature variations. No other reason was at hand to explain his ocular affection. Appreciating the important part temperature variations play in the etiology of retrobulbar neuritis, Hanke was led to ascribe the disease to these factors, the patient being consequently awarded damages.

Six years later the patient's younger brother, an employe in the same factory, appeared at the Fuchs clinic with precisely the same symptoms—scintillations, headache, vertigo, transient amaurosis followed by decided visual impairment, and large central scotomata with blanching of the temporal sides of the disks. In this case there was no clear history of exposure to the influence of temperature changes. The symptoms exactly coincided with those of hereditary optic neuritis described by von Graefe and Leber. Nevertheless Hanke considers the diagnosis rendered in the first case under the circumstances entirely justifiable. The latent hereditary disposition to optic neuritis was present in both cases, but in the former the influence of traumatism was instrumental in provoking the disease; this seems all the more probable since it is recognized that influences, such as stated above, can of themselves induce retrobulbar neuritis. A. C. S.

ABSTRACTS FROM FRENCH OPHTHALMOLOGICAL LITERATURE.

By David DeBeck, Sc. B., M. D.

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Alypin: A New Local Anaesthetic.

Chevalier and **Scrini** (*Bull. Gen. de Ther.*, Mar., 1906) consider the chemical composition and the physiological action of this new local anesthetic. On animals it produces a preliminary period of exitation, followed by marked effects on the central nervous system. These effects are paralysis and general analgesia; the convulsive effects are weaker than with either stovaine or cocaine.

Injected into the veins its toxic effect is much greater than stovaine. For this reason, and on account of its energetic action on the medulla when introduced into the general circulation it cannot be advised for medullary anesthesia. For infiltration anesthesia it presents no advantages over stovaine.

A 1% sol. has no effect on the pupil, the accommodation or the tension; but a 5% sol. produces a moderate mydriasis, lasting less than an hour. The local hyperemia produced may last two hours in the eye of a healthy subject.

The anesthesia is quickly produced, is complete, and lasts nearly ten minutes. Used as a collyrium in conjunctivitis or keratitis it has no advantages over stovaine. Used thus locally its toxicity seems less than that of cocaine, but greater than that of stovaine.

Its local action seems to depend on the same tissue changes as in the case of the other two local anesthetics; on absorption, lowering or destroying the activity of the cells.

Summing up, the new local anesthetic seems therefore to possess no marked advantages over cocaine or stovaine; and in some features to be inferior to both.

Darier (*La Clinique ophtalmologique*, Feb., 1906) reaches clinical conclusions practically identical with the above. The duration of the working anesthesia is so short (according to him not over five minutes) that two, three or even more repetitions are needed in operations taking any length of time. It appears to be practically inert on the iris, and is therefore of no special service in iridectomy.

He comes back to the conclusion that cocaine in solutions of medium strength used with care, is after all the best of all the local anesthetic agents.

Enucleation Under Local Anesthesia.

TERRIEN (*Arch d'Ophtalmol.*, Feb., 1906) has adopted the following method. Surface anesthesia is secured by dropping in a 4% sol. of cocaine or stovaine two or three times at intervals of two or three minutes. If the eye is inflamed adrenalin (1-1000) is added to this.

Then deeper anesthesia is secured by sub-conjunctival injections of a weaker solution (1-150) over each rectus, using about 30 minims. This is followed by chemosis at once, but results in anesthesia of the entire front of the globe.

At the same time an assistant has given a hypodermic injection of morphine at some point.

He then makes section of the conjunctiva, and severs the recti tendons as gently as possible (traction here is the only source of pain in the operation). Then with an Anel's syringe having a blunt, curved tip half a cubic centimetre of a solution of cocaine and morphine each 01, stovaine and sodium chloride each 02, and distilled sterilized water 5. is injected deeply around the posterior part of the globe. After waiting for a few minutes the nerve is divided and the operation completed.

Old shrunken eyes are best suited for this method; while severe inflammation, especially panophthalmitis, is absolutely contra-indicated.

Terrien (and others) found it necessary to adopt some such method owing to the law in France which has been interpreted to hold a surgeon directly responsible for the death of a patient under general anesthesia unless he had been expressly warned of the dangers attending general anesthesia. This very warning would lead many patients to refuse the operation; even when its necessity might be imperative, as in cases of threatening sympathetic ophthalmia.

Combined Anesthesia by Chloride of Ethyl and Chloroform.

GENDRON and SERVAL (*Clinique ophtal.* May, 1906) again emphasize the point to which attention has several times been directed: that accidents under general anesthesia are relatively more frequent in ophthalmic than in other branches of surgery [with the exception of dental surgery]. They recommend the preliminary administration of chloride of ethyl (10 c.c. administered through a specially devised cone); followed by smooth and cautious change to chloroform. The period of excitation is less, or is even escaped; there is less systemic shock; less drug is used (25 c.c. of chloroform sufficing for one operation of an hour and a half); accidents are rare; recovery from the anesthesia is rapid; and so little after sickness occurs, that often the patients return home the same day.

Surgical Operation or Radio-Therapy in Lid Epitheliomata.

TROUSSEAU (*Annales d'Ocul.* Jan., 1906) studies the choice between these two models. He has operated for epitheliomata (with the diagnosis confirmed by histological examinations) on patients who remained free from recurrence for 6, 8, 10, 12 and 15 years.

He has also seen excellent results from the X-rays in circumscribed, superficial epitheliomata in which the clinical diagnosis seemed certain; but of course the histological confirmation was not made. With true ulcerative, spreading epitheliomata he reports one perfectly successful case. But he has seen several in which there was no improvement; and alsc several in which the process spread into the deeper tissues even after superficial improvement and apparent cure.

His observations tend to prove that operation is after all the better method; but he hopes that improved technique and knowledge may finally give the X-ray the preference.

Protection of the Eyeball During X-Ray Applications.

BETTREMIEX (*LaClinique Ophtal.* May, 1906) gives the results of comparative trials of two eye shields. He investigated the relative permeability of the enamel shell made by Muller (the well-known artificial eye manufacturer) and the circular or ovoid lead shields made by Luer. The latter have a little handle, making them even a little easier of introduction beneath the lids than are the enamel shells; and they are moreover much more impermeable to the X-rays. The enamel is not sufficiently X-ray opaque.

B. advises against the slovenly use of lid clamps or any other make-shift protector that may be devised from and material at hand.

Radio-Therapy in Basedow's Disease.

WIDERMANN (*Arch; d'Electric. Med.,* Mar., 1906) gives the results of the therapeutic trial of the X-rays in 5 cases of exophthalmic goitre.

He worked with typical cases only. The X-ray applications were made directly to the enlarged thyroid gland. The disease was not influenced at all by the treatments. The exophthalmus and the tachycardia persisted; although in two cases the nervous symptoms were sensibly ameliorated.

In two other cases the bodily weight showed a considerable permanent gain, although the diet and home environment remained unchanged. This reached a point in one of the cases making it necessary to limit the diet.

The direct effects were negative; but this indirect effect upon the nutrition of nervous subjects may lead to results of real value.

Injections of Alcohol in Blepharospasm.

VALUDE (*Annales d'Oculistique*, Dec., 1905) reports the results in two cases of non-painful blepharospasm, of three and ten years' standing respectively, of deep injections of alcohol at the emergence of the facial nerve from the temporal bone. He employs a solution of 1 c.gr. of cocaine dissolved in 1 c.cm. of 80% alcohol; and his method is practically identical with that of Schlœsser. The auricle is pulled forwards and upwards, and the needle is pushed in between the anterior surface of the mastoid, and the lower posterior surface of the auditory canal. It is directed slightly forwards for 2 centimeters until it meets with the bony resistence of the styloid process, when its point is worked a trifle backwards along the surface of the temporal bone into the neighborhood of the stylo-mastoid foramen. The injection is made slowly: first twenty centigrams; then at short intervals ten centigrams at a time until one gramm in all has been introduced. The immediate result is a paralysis of the facial nerve on that side. This, however, passed off in his cases in about a day; the blephoro-spasm not returning with its disappearance. This freedom still persisted in his patients when last seen; one twelve, and the other fifteen days after the operation.. Valude holds that even if relapses should recur, the operation is not so severe but that it could be repeated. And even if recurrences should take place, the mere establishing of periods of freedom would aid greatly in bringing about permanent cure.

Injection of Alcohol in Facial Spasm.

ABADIE and DUPUY-DUTEMPS (*Archives d'Ophtal.* Feb., 1906) report a case of one-sided facial spasm treated by deep injection of stovaine and alcohol into the trunk of the facial nerve. This was followed at once by complete facial paralysis, of that side. This paralysis disappeared little by little; during which period there still persisted some slight spasmodic contractions of some small portions of the muscles.

After two and one-half months the paralysis and the spasms had totally disappeared. This proceedure is without any danger; is but slightly painful; and much preferable to section of the nerve trunk. This latter being followed, as a rule, by permanent facial paralysis.

Excision of the Lachrymal Sac.

GENDRON and FROMAGET (*L'Ophtalmologie Provinciale,* Dec. 1905, Feb. and May, 1906) and JOCQS (*La Clinique Ophtalmologique,* Jan, 1906) have very thoroughly worked over this always interesting question. Jocqs treats mainly of the *technic* of the operation. He is not in favor of the injection of paraffine into the sac; but prefers to open the sac, dissect or currette it out and pack it with wool wrung out of some antiseptic lotion. For the local anesthesia he used 1 cc. of cocain 1% or stovain 2%. G. and F. both make a long incision (under local anesthesia), dividing the orbicularis tendon, but avoiding the angular vessels by deflicting the lower part of the incision outwards. The whole gland is exposed and is dissected out without perforating its walls, if possible, to avoid infection. It is cut off as far down the nasal duct as possible; and this entry of the duct is thoroughly cauterized. In addition F. combines the extirpation of the lachrymal gland to relieve lachrymation. He has obtained union by first intention in 80 out of 82 cases.

G. advises it in four principal groups:

1: Old dacryocystitis, with ectasia of the sac.
2: Dacryo-cystitis treated without result by the usual method: especially in patients without the time and means to carry out a long treatment.
3: When complicated by ulcer of the cornea.
4: As a preliminary to operations on the globe; like iridectomy or cataract.

G. has operated 35 times, with the following results: In all the suppuration was cured (only in one case, in which the sac was accidentally ruptured during the operation, lasting as long as a month after the operation). The troublesome lachrymation was cured (or practically cured) in 19 cases; it was markedly diminished in 11 cases; but remained unaltered in 5 cases. F.'s statistics are somewhat more favorable than these, and he is a strong advocate of the radical operation. J. gives no definite statistics; but incidentally mentions that it cures or relieves nearly all the cases. The sum of all these views is quite optimistic.

Osteoma of Orbit Following Nasal Fracture.

ROGMAN (*Soc. Belge d'Ophtal,* Nov., 1905) reports the case of a young man who presented a solid tumor of the orbit, upon the inner wall. It presented no special points of interest except as regards its probable etiology. He had previously suffered a fracture of the bridge of the nose. The extirpation was readily accomplished, without any special features worthy of note

Sarcoma of Orbit With Conservative Operation.

VAN LINT (*La Clin. des Hop. de Bruxelles.* Mar., 1906) reports the case of a patient, aet. 14, with impairing V. for three months. Exophtlalmus of 8 mm. developed in two weeks; without pain; nearly normal mobility, except upwards; V nil, and optic disc stasis. Krœnlein. operation. The tumor had developed in the pial sheath of the optic nerve. It was a long ovoid, 17 mm. (¼ in.) in thickness, and 4 c. m. (1½ in.) in length. A short bit of the nerve intact (5 mm.) separated the tumor from the eyeball. The nerve ran along one side of the growth, but was at no point completely surrounded by it.

The result was satisfactory; some slight exophthalmus remained; movements of the eye were good, but the cornea remained insensible.

The growth was a myxo-sarcoma.

Recurrences in Interstitial Keratitis.

COLLOMB (*Revue Med. de la Suisse Rem.* Mar., 1906) gives a statistical study of relapse or recurrence in this affection; the general idea being that it rarely or never does. He gives notes of nine cases of relapse among 170 cases, coming on from one to as long after as fifteen years. Some of these had had mercurial treatment. The second attack had nothing characteristic, but the prognosis is worse. Corneal opacities are more certain to be denser and permanent.

His 5.5% is too low, owing to short time of observation (for one of his cases had a recurrence after fifteen years), Hirschberg gives 30%, which is probably too high, although v. Hippel observes five relapses among sixteen cases he followed from six to twenty years—about the same per cent. Among seventy-one cases he followed for shorter periods he saw ten recurrences; nearer C.'s. figures.

Horner regards relapses as frequent; Fournier and Saemisch as not rare; Fuchs as rare.

Interstitial Keratitis Following Frauma.

TERLINCK (*La Clinique Ophtalmol.* Feb., 1906) describes several cases from the clinic of Prof. Gallemaerts, in Brussels. eral cases from the clinic of Prof. Gallemaerts, in Brussels. Two of these were unhealthy subjects in whom the deep keratitis supervened after *slight* injuries; in one the removal of a foreign body from the cornea. Another followed a severe blow on the skull in the parietal region. Here the relation is questionable, although both T. and Prof. G. were of the opinion that it existed. Prof. G. had seen another case in which an injury had been followed by vaso-motor troubles on one side, and later by interstitial keratitis on the same side only.

These cases are quoted on account of their possible medicolegal importance.

[In and of themselves they are of no great or special interest. This relation has been long recognized by some observers. In fact, it is probably very often the case that, with the systemic conditions primed for an outbreak, the actual discharge is occasioned by some external insult; possibly very slight and perhaps overlooked.]

Colored Tattooing of the Cornea.

Chavallerea and Polack (*Soc. Fran. d'Ophtal.* May, 1906) report the results of their experiments in tattooing in color, and exhibited some rabbits and patients that excited intense interest. They have devised this method particularly for two groups: lecomata lying in front of the iris, and iris-colobomatei, especially the traumatic. (Thus one is worked into abnormal, and the other into normal corneal tissue.) Both are purely cosmetic operations.

The colors are used in the form of dry, impalpable powder, as near the iris tint as possible. These are easy of sterilization; are tolerated perfectly by the cornea, and give a very opaque tint, which remains indefinitely. The colors they have chosen give ample variety. They are Naples yellow, brown ochre, red ochre, mineral green ("la terre verte"), natural umber, burnt umber, ultramarine blue, and ivory black.

The rabbits were tattooed in various ways and colors to show the possibilities; the patients, of course, according to the clinical demands. In all the tattooing had been followed by very slight and transcient reaction.

(These researches are of striking interest, and seem destined to revive the now almost defunct operation.)

Excrescences of the Ora Serrata.

Trantas, Constantinople (*La Clinique Ophtal.*, April, 1906), describes a new appearance in the interior of the eye. He secures a view of these so-called "excrescences" or "sprouts" of the ora serrata by digital compression of the ciliary region, made by the thumb tip through the lip, while making the ophthalmoscopic examination (especially that by transmitted illumination).

This brings them into view, showing dark against the red background. On releasing the pressure they slip back out of view; and this is the explanation of why they have not been previously described.

These protuberances are rounded or bud-like, and have an *actual* size up to that of a No. 6 Bowman probe, or the head of a pin. Rarely one is found even larger. Of course the *apparent* size by the ophthalmoscope is even greater.

According to T. these appearances are common when properly looked for. He found them in twenty-six out of 100 patients examined carefully for them. Among these six were long, and very readily seen; while twenty were short and small. (But even 6% is quite a large proportion for a condition now first detected.)

He refers to histological examinations by Kuhnt, Kerschbaumer and Schoen, in which growths were found in the ora serrata; either hyperplastic, or proliferations of the cylindrical cells of this region. Kuhnt and Kerschbaumer both regard these as senile growth; while Schoen regards them as due to accommodative strain of long duration. T. is disposed to take a wider etiological view than either of these. He found these growths at different ages, so the first view is too limited. In his last fifteen cases five were syphilitic (three hereditary); there were two alcoholics, and one marked spasm of accommodation of chronic character.

He thinks that diathetic diseases, ciliary overaction from refractive error, and old age are all causal factors at times in producing this condition.

Tuberculosis of the Chorioid.

CARPENTER and STEPHENSON (*Soc. Franc. d'Ophtal.* May, 1906), as visitors to the French Society, read an interesting study of eighty cases of tubersulosis of the chorioid. These were divided into forty-nine acute cases, eleven chronic cases, and twenty "old" cases.

In the acute cases of miliary tubercles they involved usually the region of the disc and macula, and sometimes the macula itself. They were rarely seen in the periphery. In about a third of the cases there was but one tubercle; the remainder showd usually two or three, and a few had more. Both eyes were affected almost as often as one alone, which was rather surprising. There was papillitis in a third of the cases; and in over a half there were manifestations on the part of the brain.

The tubercles were usually round, oval or reniform, rarely irregular; but the ophthalmoscopic picture was variable. [The report when finally published in the Transactions will be accompanied by plates.]

The chronic form was, in appearance, not so very unlike the above; only approaching at times more the features of the disseminated or diffuse forms of chorioditis. In 119 chronic tubercular patients examined it was found eleven times; over 9%. Three of these cases were confirmed post mortem.

The "old" tubercular chorioditis was characterized by placques about the posterior pole. The zone of atrophy was limited by a circle of pigment; outside of this another zone of less marked atrophy; and around this some minute points of atrophy, like little satellites.

Anatomically these lesions are the same as occur in other organs. Koch's bacillus is found; and when negative, it was probably for the reason that the specimens had been too long in formal.

[What is surprising in these figures is that, even with the wealth of anatomical material of the London clinics, one paper could present statistics of eighty cases; and what is even more surprising, when we think of it, is the statement that among the chronic cases of tuberculosis examined over 9% were found. In keeping with this is the great number of European papers on ocular tuberculosis, contrasted with the dearth of American reports. We cannot, off-hand, allow that tuberculosis in its manifestations in one organ shows geographical preferences; neither do we like to allow that American observers habitually fail to recognize it.

Someone must cut off one horn of this dilemma; and we suggest that either Jackson of Denver, or Ellis of Los Angeles, or some other observer whose word would carry weight, in some locality where material is available, work at this problem.]

Results of Extraction of the Lens in High Myopia.

DE FONT REAULX (*Annals d'Oculistique,* Feb., 1906) gives the results of his investigations in Trousseau's clinics, on cases that had been kept under observation for five years or more, and on similar cases recorded in the literature. His conclusions are rather favorable to the operation; but he regards it as a serious question. The risks are considerable, and the remote bad results may be grave; the repeated operations that may be necessary are an element of secondary danger; and the long time that the patient must be kept under control is a great disadvantage. It appears to add to the probability of detachment of the retina; and has no influence on the progress of chorioidal degenerative changes. It seems to check the further elongation of the eyeball; although this is not so easy to determine, as any increase only shows half the amount of objective myopia as it would in an eye with the lens.

The great advantage is the securing of good distant vision unassisted; but on the other hand if there is not enough myopia left to read without glasses, the other eye is almost certain to be chosen for near work, even with the disadvantage of its very high myopia.

The operation should only be done in cases with a myopia of at least 20 D., and then only with due consideration of the patient's occupation, position, etc. Certainly no one would undertake it without clearly stating to the patient the possible risks, as well as the advantages. [As myopia of 20 D. and over is a clinical curiosity in America, to be seen possibly once or twice in a lifetime, and by many of us never met with, it is not so strange that this operation has never gained any standing here.]

Spontaneous Luxation of the Transparent Lens into the Anterior Chamber.

VACHER and GRAS (*Soc. Franc. d'Ophtal.*, May, 1906) emphasize the point that the cause of this accident is still obscure. The cases occur in old age; during poor general conditions or the convalescence from grave illness; from myopia, glaucoma, and anemia; and from violent efforts and blows.

They report two cases. One a man of forty, the luxation in the first eye came on after an attack of glaucoma in the course of a mastoiditis. In the other eye twenty months after, during an attack of glaucoma in that eye; it having remained entirely healthy up to this time. The other case a woman of thirty, a myope. She lost the right eye in consequence of the luxation of the crystalline into the anterior chamber; and three years later during the night, the transparent lens of the other eye was similarly dislocated.

In both cases the lens was removed in its capsule, through a corneal incision.

The Establishment of a Filtrating Cicatrix in Chronic Glaucoma.

LAGRANGE, Bordeaux (*Soc. Franc. d'Ophtal.*, May, 1906), presents a modified operation that warrants attention. In the treatment of glaucoma we are above all striving to re-establish the channels of excretion. In the ordinary iridectomy, and in the operation of sclerotomy the cicatrix is not likely to maintain a permanent filtration. So that some operators do not hesitate to incorporate into the scleral wound a small flap of conjunctive, or provoke a prolapse of the iris; resulting in a more or less cystoid cicatrix.

One may obtain a cicatrix having all the advantages of a cystoid cicatrix, and none of its dangers, by the following operation. Make the ordinary scleral incision for an iridectomy; but in finishing the cut turn the edge of the knife backwards, so that the wound is somewhat beveled. In the final finish of the incision leave a large conjunctival flap. With fine scissors shave off this beveled edge of the anterior lip of the scleral incision. Then finish with an iridectomy, as usual. The conjunctival flap is refixed in position over the wound, and the operation is complete.

L. has made this operation twenty times, and holds that with this operation it is easy to meet the problem of hypertension in a glaucomatous eye.

Optic Nerve Atrophy Following Erysipelas.

FRENKEL (*Soc. Anat.-Clin. de Toulouse,* Dec., 1905) reports the case of a hostler, who had had thrown into his eye a lot of dust and hair. Either by direct or secondary infection he had developed erysipelas.

There supervened exophthalmus, caused by an orbital cellulitis. After the œdema had subsided there was noticed an impairment of vision, which rapidly progressed to total blindness. This was found to be due to an optic nerve atrophy. The question arose as to whether this was due to the mere pressure of a simple œdema; or whether there had been a deep streptococcic infection involving the sheath and trunk of the nerve. F. holds to the idea of simple œdematous pressure. [This is not unlike several well-reported cases, going back to the classic case of Jaeger. The real question that should arise is why in these cases of exophthalmus the orbit is not tapped and the pressure relieved, if possible. The danger of deeper invasion of the infection (under antiseptic precautions) is not so great as the danger to vision.]

Retro-Bulbar Neuritis in Influenza.

PRIOUX (*Soc. Fran. d'Ophtalmologie,* May, 1906) insists that retro-bulbar neuritis may supervene upon inuflenza. In some of these atypical cases there is a diminution of central perception for red and green only; and a normal condition returns after one or two weeks, without any trouble upon the papilla becoming visible to the ophthalmoscope. The systemic symptoms in influenza are undoubtedly due to the absorption of toxins; and these may occasionally affect the optic nerve, as do the other well known toxic agents.

He reports one case of influenza in which in the right eye there developed an acute retro-bulbar neuritis; while in the left eye there was a distinct papillary œdema. Treatment with inunctions and leeches resulted in a complete cure. The result of this treatment might give rise to doubts; but syphilis had been excluded.

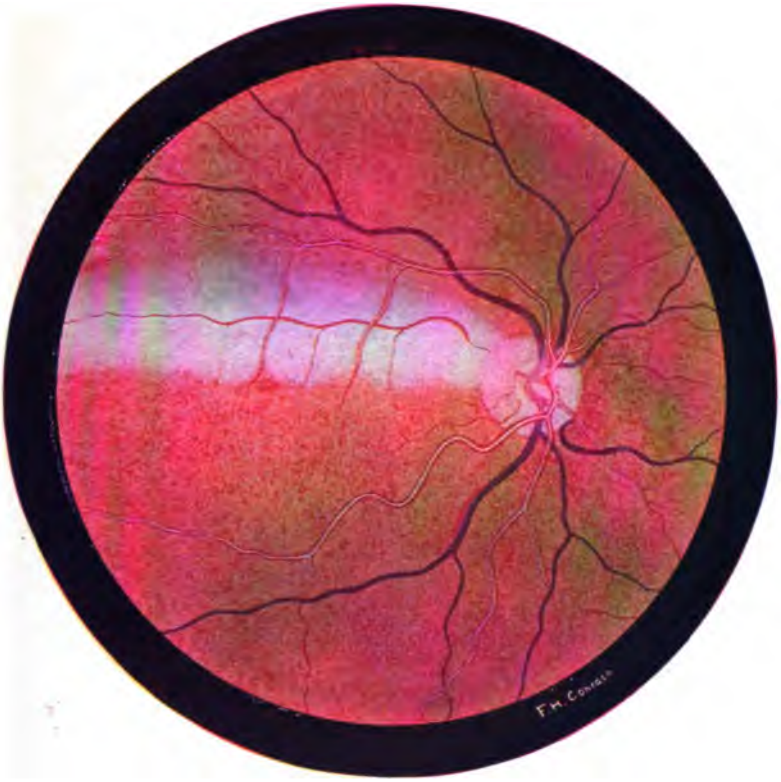
Pupillary Reflexes in General Paralysis.

MARANDON DE MONTYEL (*Gazette des Hopitaux,* Feb., 1906) has examined the iris reflexes in 140 cases of general paralysis, from the time of their entrance into his service; from the earliest priod up to the time of death. He finds that the reflexes to light and accommodation are always altered during the course of the affection; sometimes separately and sometimes simultaneously. These alterations are not steadily progressive, for there are always returns to normal (transitory, it is true) of one or the other, or even both of these reflexes. Their simultaneous loss is the most frequent, while that to light alone is twice as frequent as that to accommodation alone. That is to say, the Argyll Robertson pupil is more frequent than its inversion: except in the third period. These reflex troubles of light and accommodation increase in number as the disease progresses, and becomes more frequently associated as the affection reaches a more advanced stage.

Yellow Glasses in Ophthalmology.

MOTAIS (*L'Ophtalmologie Provinciale,* May, 1906) advises the use of yellow glasses in cases of retinal hyperesthesia, and other fundal troubles accompanied with photophobia. In all eyes, even healthy ones, these glasses seem to increase the apparent illumination, and yet give a restful feeling. It is generally admitted that it is the chemical rays: those at the violent end of the spectrum, that iritate the retina. Experiments with these glasses show that they shorten the violet end of the spectrum in proportion to their depth of tint, while the red end is unaltered.

M. has prescribed these for fifteen years with satisfactory results. Besides using them in the fundal diseases in which blue or smoked glasses are ordinarily given, he has recommended them for use with electric lights (especially arc lights), in mountaineering, and in motoring. His favorite tint is one that looks slightly orange by transmitted, and rather brownish by reflected light. The lenses needed to correct refractive errors can be ground in the tinted glass.



Embolism of a Cilio-retinal Vessel.

(Dr. Zentmayer's Case.)

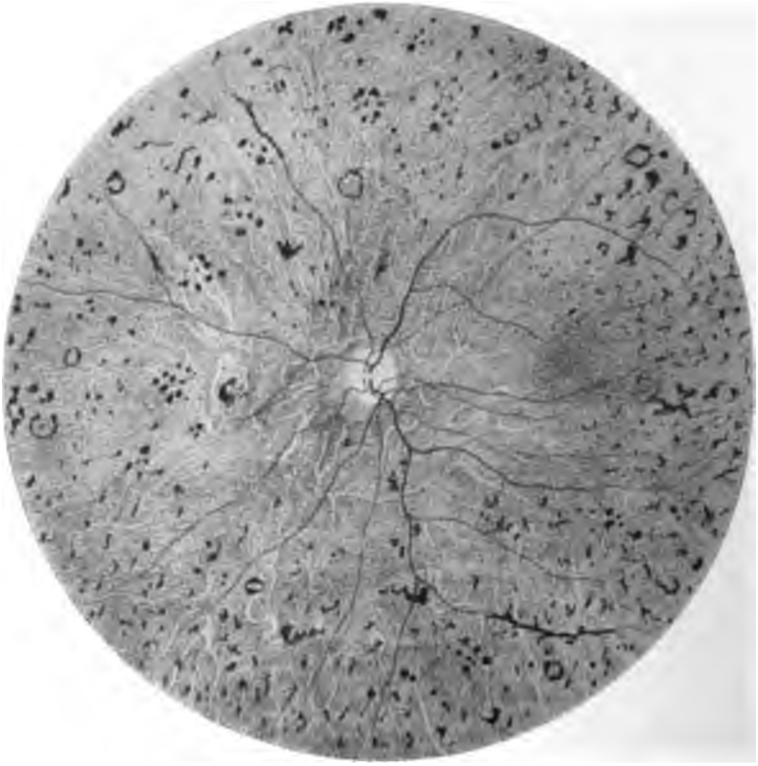


Fig. 1 O. D.
Specific Chorioretinitis, nineteen years after initial attack.

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THE LATE CHANGES OF SPECIFIC CHORIO-RETINITIS.*

PROFESSOR J. HIRSCHBERG
AND
DR. O. FEHR,
BERLIN.

On May 5, 1887, nineteen years ago, a fifty-seven year old peasant woman applied for treatment at the Berlin eye clinic. One year before, following a specific infection from her husband, the vision of the left eye began rapidly to fail, and that eye became blind. The vision of the right eye likewise began to fail, but more slowly, and at the time of her first visit, V. O. D. was reduced to the counting of fingers at 1.5 m. The visual field was contracted peripherally, and centrally for the time being there was a scotoma. The left eye recognized hand movements at 1 m.; there was no visual field. Ophthalmoscopically, O. D. under full mydriasis, showed extensive dust-like opacities in the vitreous which obscured the fundus. There was inflammation of the optic nerve and retina. The disk margins were everywhere blurred, but mostly to the nasal side and below. The retinal arteries were in places hidden. To the nasal side and above was a small hemorrhage on the disk margin. In the central region of the eye ground the retina was very hazy; there were few changes in the periphery. In O. S. the same changes were present, but less distinctly seen owing to pigment deposit on the lens capsule, and imperfect mydriasis due to posterior synechia. The urine was normal, and no other important changes were noted. The patient was given at once a full course of mercury by inunction. On May 27th there was some improvement in vision, in the worst eye (O. S.), which now could count fingers at 3 m. Twenty-three days after treatment was commenced, however, a most pronounced change for the better was noted. Vision O. D. was 1/4, and of O. S.

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*(This article appears in Die Centralblatt für praktische Augenheilkunde, October, 1906, and has been translated by Wm. T. Shoemaker, M. D., at the suggestion of Professor Hischberg.)

1/7; the visual field of O. D. was normal, and that of O. S. was almost full, but showed indistinct or imperfect dark spots within. After seventy-two inunctions of Gm. 2 each, the patient left the hospital with V. O. D. 1/3; V. O. S. 1/3-1/4; and with full peripheral fields O^u, but with a small central scotoma O^u. The inunctions were to have been continued at home.

October 13, 1888, she returned. The mercurial inunctions had been used but fifteen times. She complained chiefly of incessant flimmering before the eyes, that continued even when the lids were closed, and poor vision. The vision had fallen O. D. to ¼ and in O. S. to 1/5; the visual field showed O^u, upwards and outwards, a slight contraction. As remains of the specific fundus changes, were found, 1, dust-like vitreous opacities, and 2, small pigment spots and lines in the periphery, especially near the retinal veins. Also of course there were the pigment deposits on the lens capsule, and the posterior synechia previously noted in O. S. After another course of mercury there was again a marked improvement. November 15, 1888, V. $O.^u$ was 1/3 plus. The patient was again cautioned to continue the mercury at home, and to report every three months, but failed to do as instructed. She returned almost eighteen years later, nearly blind, more so even than at her first visit in 1887.

Upon June 19, 1906, O. D. distinguished hand movements at ½ m.; O. S. had light perception only. In the course of years her vision had gradually diminished, but she had not been otherwise ill. The eye ground however presented quite another picture (Fig. 1.—O. D.). The nerve-head was atrophic, and at the temporal side sharply defined. All arteries in the retina were reduced to threads. The veins were also much reduced. The chorioidal vessels around the disk were changed to white bands (sclerosed). These changes extended with diminishing intensity far toward the periphery. Pigment deposits and accumulations were distributed over the entire fundus. A few were found near the disk. At the equator the pigment deposits were heavier and richer, and formed a band or zone. The changes are similar to, but not identical with those found in typical pigment degeneration. (Retinitis pigmentosa.) There are numerous groups and masses of pigment, black rings, and also pigment sheaths covering portions of the arteries and veins.

In O. S. were still seen the pigment spots on the lens capsule, and the posterior synechia; the lens had become faintly opaque. One without experience might now doubt the possibility of improvement in this case and consider it as incurable. We repeated, nevertheless, the mercurial inunctions. After five inunctions the patient was better; O. D. counted fingers at 20 cm.; the visual field could be taken, and was contracted on all sides, but especially up and in. A few days later fingers were counted at 30 cm., four weeks later at 1 m., and two months later, August 2d., V. O. D. was 5/35. The visual field also improved. O. S. counted fingers at 20 cm. and had a visual field.

September 25, 1906, O. S. counted fingers at 2 m. in a narrow field; V. O. D. equalled 5/20, the visual field was good (Fig. 2). Under reduced illumination the field contracted to the pigmented zone, and central vision sank to 1/12. Notwithstanding this, however, there was not true nightblindness, the patient claiming to see even better at dusk than in bright daylight.

25. September 1906.

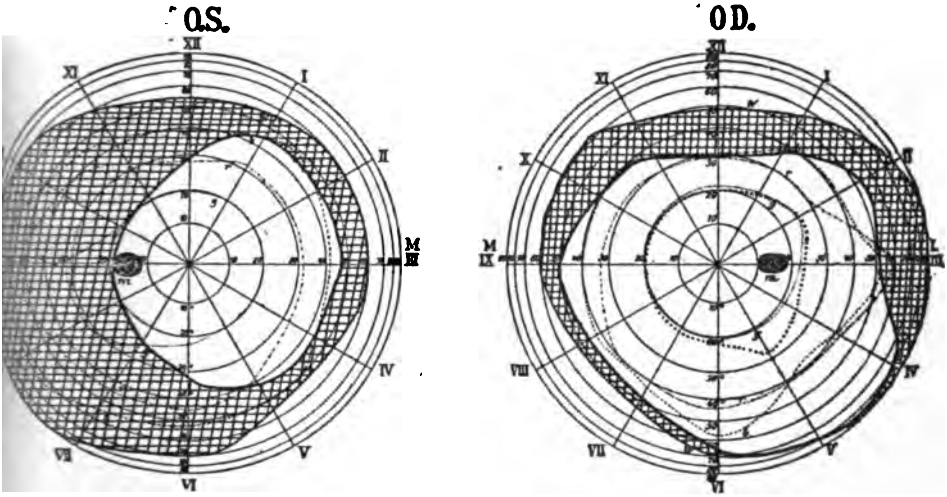

Fig. 2.

Syphilis is a chronic disease. To understand the final success of treatment, it is not sufficient to observe the cases for a short time only, a few months or a few years, with their improvements and recurrences; but our studies and conclusions must be based upon such selected cases as have been under our observation for twenty or thirty years. Cases so observed, I cannot discuss at length at the present time, but hope to later. Three such cases I can, however, mention:

1. Permanent recovery of severe specific neuro-retinitis; (that the chorioid was also involved I need not especially mention).

2. Recurrent failure of vision with subsequent improvement under proper treatment.

3. Recurrence, ending in incurable blindness. (Tabetic optic nerve atrophy after syphilis is not a true specific disease, and does not yield to specific treatment.)

The case above reported furnishes an example of class 2, and classes 1 and 3 are exampled as follows:

a.—A twenty-two year old male contracted syphilis in 1872. Two years later, or in 1874, he first complained of dark spots and bright figures before O. D., while the vision, fields, and eye ground still remained normal. Two months later the vision of O. D. began to fail, until in August, 1874, fingers were poorly seen at a few feet excentrically outward. O. S. was normal. The ophthalmoscope revealed in O. D. fine vitreous opacities, cloudy retina, and blurred disk margins. After mercurial inunction, V. O. D. was 5/40, and corrected 5/20. This was in October. The advice to continue treatment being disregarded by the patient, he returned in December with dark spots before his eye and vitreous opacities.

Treatment was again commenced, and continued for nine months. Since then the affected eye cannot be distinguished by the patient from the sound eye, and he has had no disorders which can stand in any relation to his syphilis. In July, 1906, thirty-two years after the commencement of his specific affection (he is now fifty-six years old), I examined the eye that had been almost blind, and found it to be in perfectly good condition. The corrected vision was 5/7, and the eye read fluently the finest type, and had a normal visual field. The only noticeable fundus change was that the retinal arteries were a trifle narrower than those of O. S., the sound eye. Such observations which we are in a position to make both in private and in clinic practice seem to me to be of the greatest importance. They encourage us to conduct a thorough and long continued treatment of these cases.

But unfortunately such a favorable outcome is not the rule. The results are bad in those cases that, owing to a setback, become discouraged, and fail to continue treatment for a sufficient time, so that disease of the retinal arteries has caused atrophy of the optic nerve, and pigment deposition throughout the entire fundus.

b.—In June, 1874, a forty-four year old mechanic presented himself for treatment. He had a specific infection in 1870, and in 1872 a skin eruption, since which time he has had no other sign of syphilis except in his eye.

In 1871 O. D. became inflamed; in 1872 he noticed spots before his eyes, and a reduction in vision. He was treated by an ophthalmologist with potassium iodid and leaches, and later by a homeopath.

He was a strongly developed man without signs of syphilis. Vision was much reduced; both eyes counted fingers at 4 ft.; with +6 D. S.—Sn. XX was seen for near, excentic fixation. Examination O. D. showed an old corneal opacity in the middle of the lower quadrant; numerous posterior synechia, blurred disk, and blood vessels hidden in places.

Outward and below from the disk, dense opacities projected from the fundus into the vitreous. In the center of the retina were three pale red spots. At the periphery, especially below, were disturbances in the retinal epithelium.

In O. S. there was likewise blurring of the disk and surrounding retina, but to a less extent than in O. D. The treatment consisted in a thorough course of mercury by inunction. After twelve days, or thirty inunctions of 1.5 Gm. each, salivation commenced, and marked improvement was noted. Each eye read Sn. 1.5 at six inches. He remained in the hospital four weeks, and the treatment was continued after leaving.

In August, 1874, he had the first relapse in O. D. Vision sank to Sn. XX at six inches with difficulty. Inunction Hg. In September, 1874, Sn. 1.5 at six feet. January, 1875, second relapse, O. D. V. Sn. XX at six inches.

October, 1875, third recurrence O. D.

March, 1879, fourth recurrence both eyes. (O. D. fingers at 2-3 ft.; O. S. fingers at 15 inches.)

In the center of the fundus, O. D. was a great deep patch of chorioido-retinal atrophy; numerous patches were also in the periphery, interspersed with pigment deposits. In O. S. the center was free, but numerous coal-black patches were seen in the periphery. The ever useful treatment was again ordered, but the patient withdrew quickly from observation. He returned in 1891 to have a small papilloma removed from the left upper lid, and stated that the vision O. D. had remained poor from 1879, and finally was altogether lost. While the vision O. S. was still 15/50, and this eye could read fine print, O. D. recognized hand movements only.

The nerve O. D. was atrophied, but only moderately so. Gross pigment masses were distributed throughout the fundus, reaching near the disk. In the middle of the fundus was a large deep patch with a dark margin. Peripherally were many patches, some light, some dark, and some covering the retinal vessels. Pigment absorption was noted throughout, and there was sclerosis of the chorioidal vessels. O. S. showed only a few pigment spots in the periphery.

I saw the man for the last time in 1897, twenty-three years after the commencement of my treatment, and twenty-seven years after the initial lesion. He came on account of a characteristic inflammation at the margin of the cornea O. S., that seemed to be of a gouty nature. Superficial vessels pushed into the margin of the cornea. In advance of the marginal lesions were groups of whitish points arranged in crescentic or circular form.

V. O. S. with —2 DC. ax. 90°= 5/6: the visual field was normal, and only a few peripheral pigment spots were noted. O. D. saw hand movements; excentrically he could count fingers especially below. With 50 mm. white objects, a field was obtained as in Fig. 3. Ophthalmoscopically there were seen a great white area surrounding the disk, here and there sharply defined, round pigment spots and circles, and sclerosis of the chorioidal vessels. The optic nerve was still faintly red.

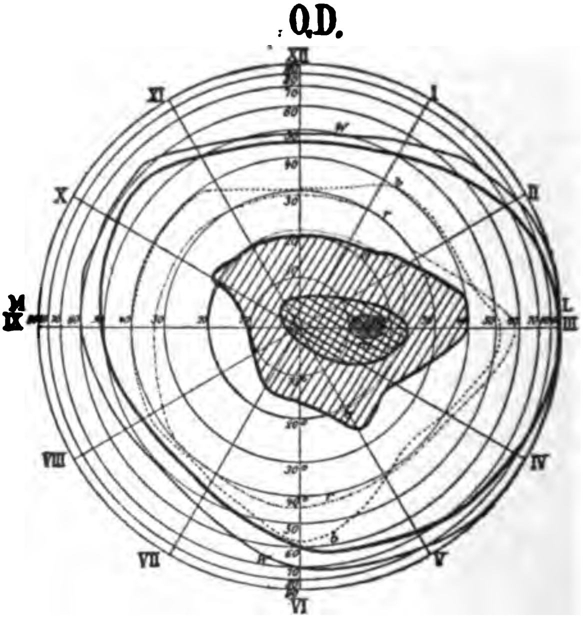

Fig. 3.

In brief, optic nerve, retinal and chorioidal inflammation began in both eyes two years after infection, progressed under potassium iodid and homeopathic treatment within two years, to almost complete blindness (V=1/50 O^2), and recovered under mercurial treatment. Through neglect on the part of the patient, the one eye suffered repeated attacks, and became almost completely blind twenty-two years after infection, and so remained; while the other or better eye remained free from serious damage.

CHORIOIDAL DISEASES: THEIR RELATION TO GENERAL DISEASES AND PARTICULARLY TO INFECTIONS, INTOXICATIONS AND AUTO-INTOXICATIONS.*

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Classifications of the varieties of chorioiditis from the time of the publication of Jonathan Hutchinson's twelve forms of this disease, to those of more recent and more scientific construction, have proved to be unsatisfactory, chiefly because of the lack of data upon which to found them. Thus, if a classification from the anatomico-pathological standpoint is attempted, we meet with the difficulty of bringing into relationship the ophthalmoscopic and microscopic lesions, although Leslie Buchanan's[1] recent admirable research might give potent aid in this respect.

For ordinary text-book purposes, chorioiditis is frequently divided into superficial and deep chorioiditis, and a well-recognized classification has been adopted which places all forms under one of two heads, namely, *non-suppurative, exudative chorioiditis* and *suppurative chorioiditis* and *iridochorioiditis,* which is another way of recording the subdivisions which even very recent works on ophthalmic pathology employ, namely, *acute* and *suppurative chorioiditis* and *subacute* and *chronic chorioiditis.*

Although certain objections strenuously urged by Mr. Brudenell Carter obtain in relation to a classification which is evolved from supposed etiology, for example, syphilitic, tubercular, etc., chorioiditis, for the purposes of the present communication, such a classification somewhat modified is useful and certainly convenient. I would therefore suggest that we consider the subject under the following headings: (1) Chorioiditis dependent upon specific infectious diseases; (2) chorioiditis dependent upon diseases of definite organs, for example, the liver and kidneys; (3) chorioiditis dependent upon diseases of the blood, notably the various anemias; (4) chorioiditis dependent upon diseases of nutrition; (5) chorioiditis dependent upon intoxications and auto-intoxications; (6) chorioiditis dependent upon diseases of the tonsillar tissues, pharynx and the sinuses.

Naturally, the artificial character of this classification must at once present itself, and also its incompleteness, as it partly excludes types of chorioiditis which have been described as hereditary, hemorrhagic, senile, etc., as well as those which are due to the prolonged effects of eye-strain, but which are not specially in consideration this evening.

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Based upon ophthalmoscopic appearances we may describe the following types:

Type I.—Localized exudative chorioiditis, sometimes denominated *acute exudative chorio-retinitis, plastic chorioiditis,* and *chorioiditis with descemetitis.* This form of chorioiditis has been observed frequently, one of the earliest and best descriptions having been made by Mr. Nettleship[2] thirty years ago, and particularly in more recent times by Hill Griffith[3] in England, and in this country by Hiram Woods[4], Harry Friedenwald[5], Colman Cutler[6], and other writers. In general terms, there is a large patch of bluish-white effusion generally denser in the center and thinning off at the margin into the healthy fundus. In Hill Griffith's cases the lesions were all in close relationship with the optic disk, but Friedenwald found, in addition to this situation, that the patch might occur close to, or directly connected with the macula, or even in the far periphery, and with his description my own experience is in entire accord.

Deposits upon Descemet's membrane may or may not be present; moderate hyalitis is the rule. After absorption and disintegration, an area of atrophy partly covered, and usually rimmed with pigment deposit, remains. In one sense the chroioiditis, to use Cutler's expression, is benign, that is to say, it yields to treatment or to time, and if the original patch has not covered the macula, or involved it in any way, vision is not at all, or not seriously disturbed.

Type II.—Diffuse Exudative Chorioiditis. In the early or acute stages of this form of chorioiditis, the lesions consist of yellowish-white, sometimes greenish-gray exudates, which may be diffuse, or circumscribed, and which shade gradually into the surrounding eyeground; or they may be fringed with pigment, small eroded areas and hemorrhages. After absorption and metamorphosis of these exudates, the condition of *chronic chorioiditis* is present, and the ophthalmoscope reveals white or yellowish-white plaques, sometimes separated by partly normal chorioid, but more often running into one another, until large expanses of exposed sclera are visible. These white patches are speckled with pigment masses of various shapes and forms, which lie beneath the retinal vessels, or, sometimes, where the atrophy has not been sufficient to expose the sclera, the floor of the eroded patches is crossed with band-like, orange-yellow or light red vessels, between which pigment is evident. Occasionally thick black masses of pigment appear on, and at the margins of the areas described.

Type III.—Disseminated Chorioiditis. The early or acute stage is rarely studied, and consists of foci, of grayish, or grayish-yellow color, often with a slightly pinkish tint, fading gradually into the surrounding eyeground. Later, in the periphery, and gradually approaching the center of the fundus, numerous round or oval spots surrounded by black margins appear. The white center of the spot is the exposed sclera, the black margin, the pigment; or a single black mass may be circled by a yellowish ring. Occasionally the spots have a punched-out look, as if a sharp instrument had cut out the tissues down to the sclera.

Type IV.—Serpiginous Chorioiditis; Serpiginous Epithelial Chorioiditis. In this type the lesion may be superficial or deep, and consists of large eroded areas, which apparently creep over the eyeground, often the one continuous with the other, their oval arcs of propagation somewhat resembling the border of an oncoming wave. The color of the patches varies according to the depth of the lesion, and each may consist of a simple erosion of the epithelium, reddish, or reddish-yellow in appearance, or where it is deeper and involves the chorio-capillaris, of a brown, or brownish-red tint, interspersed with yellowish picks and striæ, and beginning pigment disturbance. Sometimes these lesions are the only ones; at other times they are associated with those which more nearly conform to the description of the disseminated chorioiditis.

Type V.—Central Chorioiditis. The manifestations are numerous, and naturally any form of chorioiditis which directly occupies the center of the fundus could be correctly so named, for example, the plastic chorioiditis already described. Often, the area is an epithelial atrophy, either with a well-marked border somewhat opaque in outline, or with a border less sharply marked, and with pigment disturbance over the surface. Occasionally the lesions consist of areas of yellowish exudate interspersed with small round or linear pigment masses, and dot-like hemorrhages. Of those varieties which are especially known as *senile chorioiditis*, the most important are: (a) An area entirely circular with exposures of the deep vessels, which themselves are often yellowish in color, atrophied or even converted into white lines, the so-called *sclerosis of the chorioidal vessels*, and forming an alveolar atrophy of the chorioid. (b) Senile guttate chorioiditis, the collection of white spots in the macular region being dependent upon colloid degeneration. (c) An oval, circular or sometimes cone-shaped patch of grayish-white or yellowish-white tissue which lies beneath the retina, and seems to be in the chorioid, and which which remains unchanged for years.

A large number of anomalous forms of chorioidal changes are frequently observed. Sometimes they are hemorrhagic, sometimes atrophic, sometimes occupying a position, in so far as their lesions are concerned, intermediate between these two manifestations, and sometimes exhibiting themselves only in small yellowish or maroon-colored spots, or areas of slight pigmentation with islands of exposure of the chorioidal vessels. It would not be possible to separate them into special types, and they are not particularly manifestations which are in consideration in the present communication.

I come now to consider in more detail the previously suggested subdivisions of this subject.

I. *Chorioiditis Dependent on Specific Infectious Diseases.* —First in importance among the specific infectious diseases in their relation to chorioiditis stands *syphilis*. We must, however, agree with Alexander[7] that, with the exception of Forster's diffuse chorioiditis—the chorioidal form of specific chorio-retinitis of other writers — there is no manifestation of chorioidal disease which can be considered pathognomonic of this constitutional taint.

To be strictly correct, even diffuse chorioiditis, or more accurately, chorio-retinitis, is not always diagnostic of syphilis, and Venneman[8] is doubtless correct when he says that exceptionally, a clinical variety of this affection is manifest, which in all particulars resembles the syphilitic form, but which may be due to other toxins, as they are developed by septicemias, gastro-intestinal affections, and perhaps uterine complaints, although the disease is more likely under these circumstances to be complicated with iritis, and the affection therefore to be an irido-chorioiditis. Be this as it may, we may say that in so far as the chorioid is concerned, constitutional syphilis may provoke in it lesions which appear:

(1) As a diffuse chorioiditis, or, more accurately, a chorio-retinitis, in one variety of which at least the affection begins in the chorioid, and the retina is secondarily affected. It is not necessary to describe the well-known symptoms in detail, the most notable of which are dust-like opacities in the posterior layers of the viterous, loss of transparency of the retina, yellowish spots of exudation, bounded sometimes by pigment, which lie beneath the vessels of the retina, occasionally deposits on the posterior layer of the cornea, night blind-

ness, ring and other forms of scotoma, micropsia and metamorphopsia.

In the acquired disease, it appears in from one to three years after infection, and sometimes as early as the sixth month. More frequent in this variety of syphilis, it has been seen also in the congenital form of the disease.

(2) As a disseminated chorioiditis of the type already described (Type III). This form of chorioiditis cannot be said to be pathognomonic of syphilis in any sense of the term, although it is probable, as has so often been stated, that it is more likely to be of syphilitic origin if there are also vitreous opacities. Occurring both in the acquired and in the congenital varieties of the disease, it of itself gives no evidences as to which of the two forms is the etiological factor, unless it be true, as Nettleship has stated, that there is more apt to be greater pigmentation in the congenital, than in the acquired syphilis. It should be looked upon as a late manifestation in most of the instances, and belongs to a tertiary period. Cases, however, appear as early as the sixth month, and from then on to the second year.

(3) As a diffuse exudative chorioiditis, that is, Type II, which is diagnostic of syphilis even less certainly than disseminated chorioiditis, although undoubtedly frequently caused by it, and under the same circumstances, and at the same period.

While it is true that *chorioiditis areolata,* the well-known Förster type of the disease, in which the region of the disk and the macula are affected with numerous spots, larger than those seen in disseminated chorioiditis, their centers being white and their borders rimmed with black and sometimes undermined, may be due to syphilis, it is by no means certainly so, and often its etiology is entirely obscure.

That some of the forms of *central chorioiditis,* where the lesions are directly confined to the macula in areas of exudate and atrophy, may also be due to syphilis is unquestioned, as is also, in rare instances, the so-called *anterior chorioiditis,* with lesions far in the periphery which readily escape attention. This latter is sometimes a special form of disease, but more often, I think, the result of an extension backward from affections of the ciliary body and iris. The beginning of the true form of disseminated chorioiditis in the periphery is not to be forgotten, lest insufficient examination with the ophthalmoscope fail to find the foci.

Diffuse syphilitic chorio-retinitis depends upon a filtration of the toxin of syphilis throughout the tissue of the chorioid, where the pathological changes of cellular infiltration, exudation, and later of atrophy and proliferation of the pigment epithelium are found, followed by secondary changes in the retina, and associated, sometimes, with complete disappearance of the chorio-capillaris, secondary pigmentation of the retina, and atrophy of the optic disk. The disseminated and circumscribed varieties of the disease depend upon local deposits of the toxin of syphilis and its effects, in contrast to the diffuse dissemination of the virus in the first form of the affection.

It is hardly necessary to take up in detail those lesions of the fundus which are more or less characteristic of *hereditary syphilis,* chiefly because they are not, as is almost never the case with chorioidal disease, confined to the chorioid, and partly because it would lead us into too wide a discussion of this matter at the present time. Without entering into the dispute as to whether the seat of the disease in these cases is in the retina or in the chorioid, the three chief types are, as Haab and Sigler-Huguenin have well pointed out, those in which the periphery of the eyeground presents a somewhat leaden color, and contains black, circular and triangular patches of pigment, while the remainder of the fundus is covered with reddish-yellow spots; those in which round foci of pigment, discrete and confluent, are situated chiefly in the periphery of the eyeground, a condition of affairs noted not infrequently after the subsidence of interstitial keratitis; and finally, those in which, in place of gray and black lesions, white, circular, or confluent patches are found in the periphery of the fundus.

Second in importance among the specific infectious diseases in their relation to chorioiditis is *tuberculosis.* The manifestations may be: Tubercles of the chorioid in the form of yellowish-white spots, miliary in character, dull yellow-white in the center, and encircled by an ill-defined, rose-colored area; exceedingly minute, yellowish-white spots, the so-called chorioidal dust; large single growths, that is, conglomerate tubercular tumors; and, finally, that condition in which there is a diffuse yellowish-white discoloration occupying a large area of the eyeground, interspersed with yellowish-white spots, and which is really a chronic chorioidal tuberculosis.

Of importance, however, in the present discussion is the fact, now well established, that a very considerable number of the cases of ordinary disseminated and diffuse exudative chorioiditis, and very rarely localized plastic chorioiditis, are due to tuberculosis. The statement made a number of years ago by a well-known oculist, that if there was any other cause for disseminated chorioiditis than syphilis, he did not know it, is no longer tenable, and investigations, particularly since the introduction of tuberculin, and the method in which it is employed for diagnostic purposes, have demonstrated beyond a shadow of a doubt that tuberculosis is frequently the basis of the disease. From the practical standpoint, the diagnosis is important as regulating the therapeutics of the affection, and I have no question that many a case of disseminated chorioiditis has been badly treated with injudicious mercurialization, in the belief that it was syphilitic, when in point of fact it was of tubercular origin.

The foci form in the chorioid, under the influence of the tubercular infection, in precisely the same manner in which they arise in the meninges, the pulmonary tract, the lymphatic system, and, indeed, in any of the tissues of the body. The association of tubercular disease of the chorioid with tubercular disease of the meninges is too well known to require discussion.

Third in importance among the specific infectious diseases in their relation to the uveal tract and its inflammations, is *influenza*, and, as Groenouw remarks, two great groups are evident, one included under the term *uveitis*, and the other under the term *metastatic ophthalmitis*. Of the former the clinical picture is apt to be an iritis or an irido-cyclitis, and it is comparatively rare that a pure chorioiditis, which, however, has been reported, is the localized lesion. Lewin and Guillery, however, make reference to the development of exudative inflammation of the chorioid of a fibrinous character as the result of this infection, dependent probably upon its toxin, or upon the lodgment of bacilli. If, however, either the bacilli or the toxin are especially virulent, then the widespread lesions of purulent chorioiditis or metastatic ophthalmitis are evident, with which disease we are not now concerned; nor are we concerned with uveitis in the ordinary sense of the term.

Fourth in importance among the specific diseases in their relation to chorioiditis are certain of the fevers, notably *typhoid fever*. In so far as typhoid fever is concerned, judging from the literature, the cases are not numerous, but certain ones are on record. To some of these I have made reference in my article on *The Ocular Complications of Typhoid Fever, in Keen's Surgical Complications and Sequels of Typhoid Fever.* It would seem that the lesions are apt to arise during the period of convalescence, at the same period, in other words, in which Bull, Hansell and many other authors have described floating opacities in the vitreous. The type of chorioiditis which would be most likely encountered is the localized exudative variety, and indeed, this has been reported by Alt. I have seen it once, Cutler refers to it in his paper, and I am persuaded that if a more minute examination of the visual organs were made during typhoid fever, affections of the uveal tract would probably be more often found, and it would seem likely that the chorioid would not be immune in these respects.

We know that the distribution of the bacillus of Eberth is widespread in this disease, and that pure cultures of it have been found in the blood, the endocardium, the walls of the arteries and veins, and in the perivascular tissues, and there seems, therefore, no reason why we should not believe that localized infections in the vascular tissue of the chorioid might occur during typhoid fever. In other words, there is no reason why chorioidal lesions should not arise by reason of a microbic invasion of the vascular walls, exactly as the not infrequent occurence of retinal hemorrhages has been noted, which Charles Stedman Bull suggested might depend upon an altered quality of the blood, or a weakened condition of the blood vessel walls, and which Keen believes may be due to bacterial invasion of the vessel walls.*

Judging from a few reports, it is probable that *croupous pneumonia* may at times have a relationship to chorioiditis. It will be remembered that Axenfeld found, microscopically, circumscribed infiltration spots in the chorioid from a case of pneumococcus septicemia, resembling fresh spots of disseminated chorioiditis, and which were attributed to the presence of pneumococci of low virulence. Fraenkel[9] observed, ophthalmoscopically, similar small yellowish spots, which subsequently disappeared, during pneumonia, and which he attributed to emboli of pneumococci, and Peters[10] has seen in pneumonia, iritis and a fundus appearance resembling fresh chorioiditis, or chorio-retinitis, which was believed to depend upon emboli of pneumococci.

It would not be profitable, nor does time permit an analysis of each specific infectious disease in relation to chorioiditis. As is well known, in individual instances such relationship has been supposed to exist between a number of them not yet mentioned, for example, certain of the exanthemata, malaria, gonorrhœal rheumatism, and probably diphtheria. Only recently I examined a child eight years of age, who two years before had suffered from a violent attack of diphtheria. Nothing was noted in so far as her eyes are concerned, until she came for the purpose of having a refractive error corrected, when a large oval patch three times the size of the optic disk, of atrophic retino-chorioiditis, evidently the sequel of a plastic exudate, was seen in the periphery. Now it may, or may not have been the result of the diphtheria, and the case is mentioned simply to show how vague these relationships often are, and yet, how impossible it would be to say that the infectious disease referred to was not because of the chorioiditis. The point that I wish to make clear is that we must not be too prone to attribute to syphilis patches of old chorioiditis. The relationship of tuberculosis has been referred to, and I suspect that in many instances at some time or other of the patient's life there occurred during the active process, or more often during the convalescent period of some specific infectious disease, a patch of exudative chorioiditis too far from the macula to produce disturbance of vision, and hence not discovered until the eyes came under examination for some other purpose.

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*During relapsing fever, the uveal tract is often involved, but rarely, if ever, the chorioid alone.

II. *Chorioiditis Dependent Upon Disease of Definite Organs, For Example, the Liver and the Kidneys.*—Systematic writers, for example, Schoebl, in differentiating the various forms of albuminuric retinitis, have established a type to which the name albuminuric chorio-retinitis has been given, which is really a degenerative form of albuminuric retinitis with chorioidal changes in the form of pigment spots and areas, which border the zones of exudation, or in which, added to the picture of nephritic retinitis, there are pigment deposits and changes in the chorioid, which simulate disseminated chorioiditis.

Modern investigations indicate that in large measure the ophthalmoscopic picture of so-called retinitis albuminurica, as Von Michel has pointed out, is the outcome of disturbance in the circulation, and of lesions in the retina, brought into existence by a primary disease of the vessel system of the central retinal artery and vein, that is, of an arterio- and phlebosclerosis with their sequelæ. It is interesting to observe that similar sclerotic changes take place in the vessels of the chorioid, and that therefore there is no reason why chorioiditis should not develop under the influence of chronic Bright's disease. Indeed, Magnus has described an independent form of *albuminuric chorioiditis,* and the ophthalmoscopic evidences of chorioidal disease were depicted by Liebreich many years ago. If Schreiber is correct, very occasionally disseminated chorioiditis, or an appearance exactly simulating it, may be due to nephritis. All of us must have seen cases of chorioiditis, either of the disseminated variety, or of the localized form, in old cases of Bright's disease. It is possible that in some of these cases there was at one time a moderate retinitis which had cleared and left in its place the chorioidal lesions to which reference has been made. In brief, then, there is no type of chorioiditis which could be considered as diagnostic, or even indicative of Bright's disease, but there is also no reason why nephritis should not cause changes, as we know it does, in the vessels of the chorioid, and therefore be responsible for chorioiditis, or, more accurately, for chorioidal degenerative changes.[11]

In so far as the diseases of the liver are concerned, it is of course well known that in certain types of jaundice there is hemeralopia or night blindness, and that certain ophthalmoscopic changes have been described, chiefly consisting of disturbances in the pigment epithelium, and the formation of small flecks in the retina. It remained for Baas,[12] however, to write elaborately concerning this *ophthalmia hepatica,* as it is called. His anatomical investigations, as well as those of several others, have shown a cellular infiltration of the chorioid with changes in the retina, especially in the pigment epithelium, as well as edema of the retina and of the optic nerve, and inflammatory processes in the walls of the vessels. Baas noted that in certain positions, there was a distinct shrinking or atrophy of the chorioid, and he desired to give it a name which would place it in analogy with pathological changes in the liver, and speak of it as *cirrhosis of the chorioid,* precisely as we speak of cirrhosis of the liver. I am not prepared to say that one is able to elaborate a type of chorioidal disease which could be brought in association with hepatic disturbance, but the whole subject of the relation of the diseases of the liver to ophthalmoscopic changes ought to be more thoroughly studied. During the life of the late Dr. E. O. Shakespeare, while I was his colleague in the Philadelphia General Hospital, I made a number of studies along these lines in extension of those already begun by him years before. The great difficulty, however, of bringing into relationship, ophthalmoscopic changes with the definite lesions ascertained by autopsy, caused us to discontinue the research, and I can only say that we never succeeded in doing more than finding such vague lesions as small yellow spots, slight pigment changes, areas of atrophy and spots of chorioiditis in patients who had liver disease.' We could not, however, find a type. I commend this line of research to some of my younger confreres.

III. *Chorioiditis Dependent Upon Diseases of the Blood, Notably the Various Anemias.*—In almost any textbook dealing with a description of chorioidal diseases, and assigning as etiological factors various constitutional and local conditions, the statement will be found that anemia is responsible for a certain number of them. For example, Hill Griffith says, "Poorness of the blood without special cause, and profound anemia, must be reckoned as more or less frequent cause of chorioiditis." Similar statements are made by Fuchs and other well-known writers. Groenouw,[13] referring to the fact that so-called serous iritis and chorioiditis have been referred to chlorosis as the etiological factor, remarks that such an association from the standpoint of cause and effect is at least doubtful. On the other hand, when one remembers the extensive changes which pernicious anemia causes in the retina, and particularly the changes which occur in the central nervous system, with the scattered foci of degeneration, chiefly in the posterior and lateral columns of the spinal cord, and that these lesions are almost certainly the manifestation of a toxemia, there is almost no reason why chorioiditis or chorioidal degeneration should not arise likewise in this disease. My own microscopic studies of the retinas in pernicious anemia,[14] while confirming those made by Uhthoff in regard to the position of the hemorrhages, and notably the varicosities of the nerve fibers of the ganglion cell layer, failed to show any distinct chorioidal changes. We are again met with the difficulty of proving that because a person with anemia has chorioiditis, the anemia is the etiological factor, but we also know of no reason why it should not be so considered when we remember the power that this disease, or the toxemia which produces it, has in causing degenerative foci in other tissues of the body.

IV. *Chorioiditis Dependent Upon Diseases of Nutrition.*—Among the diseases which systematic writers include under the title just recorded, which have been brought into etiological relationship with various types of chorioiditis, the most important are, gout, arthritis deformans, various types of chronic rheumatism, and ostitis deformans. In so far as gout is concerned, that is to say, that disease which depends for its existence upon a disturbance of metabolism, as a result of which in various portions of the body deposits of biurate of soda occur, it has long been believed to be a cause of various diseases of the uveal tract, and therefore a possible cause of chorioiditis. There is no doubt that gout is the responsible agent in many of the types of so-called hemorrhagic retinitis, hemorrhages into the vitreous, and apoplexies of the retina, and it is not necessary to discuss the elaborate literature with which we are all familiar. Now, as Leber long ago maintained, there may occur in the same individual, hemorrhagic retinitis, simple hemorrhages of the retina and vitreous, and disseminated chorioiditis, and it is probable that the two conditions depend upon one and the same cause. As he points out, the toxic agent, whatever that may be, is arrested in the capillaries of the retina and produces there a mechanical obstruction. If to this is added a toxic influence, the changes will be those which we dominate hemorrhagic retinitis. In the chorioid, where the arterial anastamosis is abundant, and the capillaries are large, the mechanical effects of plugging are not so evident. Nevertheless, there will be circumscribed spots of adhesive inflammation, and Leber, referring to the etiology of this combination of retinitis with chorioiditis, found among the commonest of the antecedent complications various types of rheumatism. In the same way I suggest we should explain the relationship of gout to chorioidal disease, and this, in a word, would also explain those forms of chorioiditis which are found in association with chronic rheumatism, or that condition in which a low-grade inflammatory process arises in synovial membranes and fibrous tissues, or possibly even in that disease which is ordinarily called muscular rheumatism, and which is so badly understood, but possibly depends upon the deposition of toxic materials which are produced by perverted metabolism. While acute rheumatism, or, more properly, acute rheumatic fever, is an infectious disease, and therefore does not belong in the class now under discussion, it is suitably considered here. Personally, I have never seen a chorioiditis during the course of an acute rheumatic fever, nor have I but once seen during the same process an involvement of the iris, although we so frequently assert that a large portion of our cases of iritis are rheumatic in origin. This may be so, but they do not occur, at least not in my experience, during the acute stages. Now as the chronic forms of rheumatism may be sequels of acute rheumatic fever, it is quite conceivable that the method of the infection of the chorioid in localized areas, to which reference has already been made, takes place, and is discovered either later, when the acute process has cleared up, or is a sequel of the condition, exactly as the chronic rheumatism itself may be a sequel.

Few of us would be willing to state, as has T. E. Converse,[11] that forty per cent. of all cases of chorioidal troubles are due to the uric acid diathesis, or really represent what he calls attacks of "rheumatism of the chorioid," in the first place, because of the evident confusion between the so-called uric acid diathesis and rheumatism, and, in the second place, supposing that he refers to what is really rheumatism, the percentage is too high; but he is probably correct, as was Leber long before him, in assuming that some cases of chorioiditis may be associated with that pathological condition which more or less vaguely is denominated rheumatism—the toxic or diathetic rheumatism of some writers—and depend upon alterations in the chorioidal vessels in the manner already described.[1]

V. *Chorioiditis Dependent Upon Intoxications, Toxins and Auto-Intoxications.*—Using the word "intoxication" to refer to those affections of the ocular apparatus which depend upon various drugs and chemicals, and which constitute the class of the intoxication-amblyopias, little need be said in so far as chorioiditis is concerned, because there is no evidence to show that any of them, except in the vaguest manner, are responsible for this lesion, except, perhaps, for a form of chorioiditis which has been attributed to the inhalation of bisulphid of carbon. Other poisons, notably lead, may give rise to changes in the chorioid; these, however, are secondary to a retinitis, which in its turn may have been produced by a nephritis.

To be reckoned among the intoxications are the various ptomains, that is to say, meat poisoning, poisoning by shell fish, fish, etc., and although we are well acquainted with certain of their ocular symptoms, for instance, paralysis of both the external and internal ocular muscles, mydriasis, etc., but little has been written on the lesions which they may produce in the fundus. In this respect, we are particularly indebted to Charles Stedman Bull,[18] who, after a discussion of the various intestinal intoxications and the ocular lesions which they can produce, as well as the bullae in the skin which are the result of their influence, reports two cases of ptomain poisoning in both of which, in addition to mydriasis and paralysis of accommodation, there were extensive lesions in the chorioid in the one, in the form of scattered yellowish-white exudations, varying in size and very flat, and in the other, in a form of chorioiditis or chorio-retinitis that resembled the syphilitic variety of the disease. Syphilis, however, was entirely absent in these cases, and the results of treatment showed that they were due to an intestinal intoxication from ptomain poisoning.

Closely allied to these intoxications, are the various auto-intoxications, and their relation to ocular lesions is attracting renewed attention. Recently I have discussed this subject.[17] By auto-intoxication, to quote Albu, we mean a poisoning of the organism by the products of its own metabolism, which may be normal, but accumulated in excessive quantities, or they may be abnormal. We separate from the auto-intoxications, the specific infectious diseases because, as Chapman puts it, only such substances as are elaborated in, or originate in the system, should be regarded as causing auto-intoxications. Thus, the poisonings to which reference has just been made under the term ptomain poisoning, represent a different process from an intestinal putrefaction in which poisonous diamins are originated in the bowel lumen. In other words, again to quote Chapman, auto-intoxication must not be confounded with auto-infection. From the standpoint of eyes we may divide auto-intoxications, as Uhthoff does, into those which are intestinal or *enterogenous,* and which are caused by affections of the digestive tract which lead to abnormal fermentation and decomposition processes, and those which are *histogenetic,* and which are caused by the products of individual metabolism, as, for example, gout, diabetes, uremia, anemia, pregnancy, or are brought about by insufficient elimanation of poisons because of disease of certain organs, for example, the thyroid, adrenals, liver, etc. In the present discussion we have nothing to do with the histogenetic auto-intoxications, to which reference has been made under other subdivisions, but are interested only in those which are intestinal or enterogenous. It is true that our knowledge of auto-intoxications, is a very limited one, and, in point of fact, as Alonzo Taylor has said, we really do not know the entity of a single intoxication except the acidosis of diabetic coma. That auto-intoxications exist, however, is well known, even if their true nature is as yet a mystery.

As Elschnig has shown, and as I think must have been the experience of all of us, there are a definite number of cases of uveal tract disease, notably in the form of chronic iridocyclitis and relapsing or recurrent iritis, in which examination, notably examination of the urine, indicates the presence of an intestinal decomposition, in which tuberculosis, syphilis and other infectious disease may be eliminated as casual agents, and in which, therefore, it is fair to assume that in some manner the products of intestinal putrefaction are the etiological factors. In these cases, ordinary treatment is unavailing, but treatment directed toward the rectification of the anomalies of the intestinal tract, is followed by a cure of the ocular lesions. Now, while Elschnig himself suggests that many cases of chronic chorioidal disease may be due to gastro-intestinal intoxication, he is unwilling to be more definite than this, although he feels sure it is the cause of other uveal tract diseases to which I have made reference. It seems to me, from my own experience and from the experience of my colleagues, that cases are accumulating in which various types, chiefly of plastic chorioiditis of the localized variety, sometimes of disseminated chorioiditis, and occasionally either of exudative chorioiditis, or of serpiginous chorioiditis (type 3), must be attributed to an influence which is derived from a disordered gastro-intestinal tract, either in the form of an auto-intoxication, or in the form of an auto-infection.

It is not necessary to burden this paper with case histories. These chorioidal lesions have been referred to by Cutler, Friedenwald, Bull, Elschnig, Groyer, myself and many other writers. As Bull points out, as Elschnig maintains, and as Edsall and myself have shown, the strongest indication that the toxins from the intestinal tract are the active agent, is that the disease gets well by the regulation of the bowels and the restoration of their functions to the normal standard. These patients are not syphilitic, they are not tubercular, they have not recently suffered from acute infectious diseases, they do not manifest in any way any other cause for this condition, and therefore in the absence of such other causes we have a right to assume that the intestinal toxins are a probable factor in the production of the chorioidal lesions.

We know, for example, that disturbances of menstruation are a not infrequent source of infections and intoxications, and the recent elaborate study of Riebold[18] indicates that there is little doubt that the menstruating uterus may prove to be the source of infection for actual septic affections, manifesting themselves not only by fever, but by lesions particularly of the skin, for example, erythema, urticaria, herpes zoster, and even of conditions which resemble rheumatism. Ophthalmologists are well acquainted with the various ocular disorders which occur under the same conditions—retinal hemorrhages, optic neuritis, particularly unilateral optic neuritis, retrobulbar neuritis, and I have no doubt, although I have no cases to report, of chorioiditis. Now, if it is true that anomalies of menstruation may cause infections depending either upon bacteria or bacterial toxins, which find their expression in various skin lesions, it is even more true that similar and analogous skin lesions are the result of auto-infections and auto-intoxications.[19] If these various skin diseases—types of eczema, urticaria, pemphigus, herpes zoster—should be regarded as lesions which indicate an effort on the part of the skin to get rid of a toxin, why may we not regard a number of the types of chorioiditis with which we are familiar as a similar effort on the part of the chorioidal membrane to rid itself of a toxin, bacterial or otherwise, which has lodged within its circulation and brought about an adhesive inflammation with exudation in the manner in which Leber showed was possible long ago?

A very interesting phenomenon is that the same etiological factor repeated on different occasions does not always find its interpretation in the same lesion of the same organ. Thus, we are all familiar with the cases which have been reported by Marcus Gunn, by myself, and by Lezinsky, in which apparently the same cause will on one occasion produce a retrobulbar neuritis and on the next, in the same patient, a facial palsy, and so facial palsy and retrobulbar neuritis alternate. I have seen, and doubtless all of us have seen, exactly the same state of affairs in so far as skin lesions and chorioiditis are concerned. Thus, I have a patient who had in the right eye a sharp attack of localized plastic chorioiditis near the macula. Two years later an exactly similar attack in the fellow eye, not, however, with a situation quite so close to the macula, and again, two years later, a sharp attack of herpes zoster, on this occasion the chorioid remaining unaffected. This may be a coincidence, but it is an interesting one. Again, I have a patient, a young woman, who appeared with a plastic chorioiditis in the periphery of the left eye below the macula. About a year later she was attacked with a form of eczema which was notably located upon the face, mouth and neck, and which, like the chorioiditis, was associated with all of the symptoms of intestinal decomposition, and rapidly disappeared under suitable treatment. In other words, there is no reason why there may not be a distinct analogy between these perfectly definite established skin lesions in their relation to the various intestinal infections and intoxications, and certain types of chorioiditis, notably plastic and serpiginous chorioiditis. As one of my assistants once said to me after I had lectured on this subject, "I suppose you mean that the intestinal toxin may sometimes find expression in an effort of elimination by the formation of a boil, and at another time by the formation of an exudate in the chorioid." While perhaps I did not put it as bluntly as this, it is practically what I do mean and what we all mean.

VI. *Chorioiditis Dependent Upon Disease of the Tonsillar*

Tissues, the Naso-Pharyngeal Area and the Sinuses.—That the tonsillar tissue of the throat may be the port of entry of various infections, notably tuberculosis, has been maintained by a number of writers. According to G. B. Wood,[m] it is probable that in the majority of cases of tubercular adenitis in the cervical lymphatics, the infection originates either in the faucial tonsils or in the pharyngeal tonsil. He points out that the faucial tonsil drains its lymph into a gland just below, and behind the angle of the jaw, and that subsequently the lower glands of the deep cervical group may become involved. Infections entering the pharyngeal tonsil affect the lymph glands placed just below the posterior border of the sterno-cleido-mastoid.

It is not germane to the present topic to discuss the possibility of pulmonary infection from the tonsils, but Wood believes that the evidence in favor of this method of infection is increasing, and it has been maintained, also, that not only may the infection reach the lungs in this manner, but that obscure infections of the abdominal cavity have gained their entrance into the body by the same route.

So far as I know, no one has proved that an infection passing through the tonsillar tissue might reach the eye, and if the eye, probably the chorioid, and there produce deposits, together with adhesive inflammation and exudate. The fact remains, however, that in a certain number of cases of chorioiditis with descemetitis, of uveitis in the wider acceptation of the term, and perhaps of ordinary circumscribed or even disseminated chorioiditis, the only history of ill health, associated with the ocular disease, or more often preceding it by some weeks, or perhaps even months, is one connected with some type or other of tonsilitis or of disease of the naso-pharynx, and I suggest that this is a subject worth consideration from the standpoint of research, and that we may connect some hitherto unexplained cases of chorioiditis with infections of this region.

Dr. A. Jacobi[n] has called my attention to studies of his own, and of other investigators which indicate that the tonsil is not conspicuous as a portal of microbic and toxic invasion, but that, on the contrary, this structure is rather inferior in regard to facilities for absorption, to the rest of the pharynx and the nares, with their lymphatic pharyngeal ring. It would seem, therefore, that even if the tonsillar tissues should be regarded as closed ports of entry for ocular and other infections, that the pharynx and the nares offer ample pathways for the passage of toxic products, and that disease of this region in its relation to chorioiditis and allied ocular conditions is worth careful investigation.

We know that carious teeth by inoculating the lymphatic network of the gums, may cause infections of the submaxillary lymph glands, and through their connections of still wider and more distributed areas. That singularly acute observer, Mr. Nettleship, long ago noted in certain cases of plastic chorioiditis, one of which he reports in detail, that there might have been infection from carious teeth. The relation of pyorrhea alveolaris to uveitis is well established.

Much has been written in regard to the connection between disease of the sinuses, and various types of nasal catarrh, to ocular disorders, and all of us are familiar with the paper of Senn and Sprigg, which apparently established a distinct relationship between the development of certain types of irido-chorioiditis and atrophic nasal catarrh. In our own country, Fish of New Orleans has persistently maintained that accessory sinus disease is very frequently the etiological factor in uveitis, adopting Ziem's view that the passive orbital hyperemia which occurs causes venous stasis and an edematous condition of the uveal tract, and Lewis Ziegler has expressed the opinion that many types of relapsing and recurring iritis may depend upon diseased nasal conditions. If this etiological factor is potent in so far as the general uveal tract is concerned, and may originate serous cyclitis, there is, of course, no reason why it might not similarly call into existence localized chorioiditis, particularly plastic chorioiditis associated with descemititis.

Time does not permit a more elaborate discussion of this side of the question, and I can do no more than suggest that a search shall be made in the tonsillar and naso-pharyngeal area for possible sources of infection in certain cases of plastic chorioiditis of undetermined origin. In conclusion, and in resume, I may say:

1. That while syphilis is undoubtedly the most frequent cause of those forms of chorioiditis which depend upon specific infections, it is by no means an exclusive cause, and that many cases which were once supposed to be syphilitic have undoubtedly other etiology, notably tuberculosis, and probably in not a few instances, other specific infectious diseases, for example, typhoid fever, influenza and pneumonia.
2. That while there is no known type of chorioiditis which

is pathognomonic of the disease of any single organ, as, for example, certain types of retinitis are of certain chronic diseases of the kidney, it is not unlikely that affections of the blood in the form of various anemias, and notably of the kidney and probably of the liver, may at times be the source of the infection which causes a chorioiditis, and that the same is true of certain diseases of nutrition, particularly gout, varieties of chronic rheumatism, and, in general terms, the lithemic state, not always in the sense that a specific form of chorioiditis is elaborated, but that the same cause may produce a change in the retinal blood vessels, and also in the chorioidal blood vessels, and that the two affections may be combined.

3. That much evidence accumulates, that certain infections, particularly those derived from ptomain poisonings, as well as enterogenous auto-intoxications, must be given a distinct position in the etiology of chorioiditis, and that, finally, it is not unlikely that some cases of chorioiditis depend upon an infection which finds its way through the tonsillar itssue into the lymphatic system of the neck and ultimately into the chorioid, or, if not through the tonsillar tissues, through those of the tion which finds its way through the tonsillar tissue into the nasopharynx. Pyorrhea alveolaris may also be a source of infection.

4. That each case of chorioiditis not definitely syphilitic in origin should receive a study which includes the most searching general examination, notably of the secretions of the body and particularly of the intestinal tract, in order that perfunctory therapeutics, including simply the various alteratives, notably the iodids, may give place to rational measures developed by the results obtained.

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BIBLIOGRAPHY.

1. Buchanan, Leslie. Trans. Ophth. Soc. U. K. 1905, XXV., P. 122.
2. Nettleship. Royal London Ophthalmic Hospital Reports, 1876-79, IX., P. 182.
3. Griffith, Hill. System of Diseases of the Eye. (Norris and Oliver.) 1898, III., P. 355.
4. Woods, Hiram. Trans. Ophth. Sec. A. M. A. 1896, P. 113.
5. Friedewald, Harry. Trans. Am. Ophth. Soc. 1900-02. IX., P. 577.
6. Cutler, Colman. Archives of Ophth., XXXII., P. 175.
7. Alexander. Syphilis und Auge, P. 72.
8. Venneman. Encyclopedie Francaise. d'Ophthalmologie. 1906. VI., P. 240.
9. Fraenkel. Archiv. f. Ophth. 1899. XLVIII., Ab. 2, P. 457.
10. Peters. Klin. Monatsbl. f. Augenheilkunde, 1901, P. 392.
11. DeSchweinitz, G. E. Section on the Ocular Changes in Bright's Disease, in a Treatise on Bright's Disease, by James Tyson. P. 211.

12. Baas. Graefe's Archiv. f. Ophth. 1894, XL., 5., Pp. 212-239.

13. Groenouw. Graefe and Saemisch. Handbuch der gesamten Augenhk. 1901, 35, 36, P. 290.

14. DeSchweinitz. Trans. Am. Ophth. Soc.

15. Converse, T. E. Consult, Les Affections Oculaires dites rheumatismales, pas Antonelli. Archiv. d'Ophth. June, 1906. P. 374.

16. Bull, Chas. Steadman. Trans. Am. Ophth. Soc., 1905. X., P. 535.

17. DeSchweinitz, G. E. Auto-intoxication in Relation to the Eye. Trans. Soc. of Ophth. A. M. A. 1906, P. 377.

18. Riebold. Deutsche med. Wochenschr. 1906. 32. No. 29.

19. L. Duncan Bulkley. Skin Diseases and Internal Disorders, 1906.

20. Wood, G. B. The Lymphatic Drainage of the Pharyngeal Tonsil. Am. Jour. Med. Sciences, April, 1906, and the significance of Tuberculous Deposits in the Tonsil. Jour. A. M. A., 1904.

21. Jacobi, A. The Tonsil as a Portal of Microbic and Toxic Invasion. Archives of Pediatrics, July and Sept., 1906.

THE THERAPEUTIC APPLICATION OF THE X-RAY IN DISEASES OF THE EYE.

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When one considers how little is known of this wonderful agent, and then our limited knowledge concerning the pathology of most of the diseases for which it has been employed, the wonder is that such results as have been reported, should have been obtained from a remedy adopted purely empirically. In most instances it has been the recourse of *dernier ressort*, and justly so, but no doubt in the future, as it becomes more and more developed, its scope will become wider. While development is progressing, however, the utmost conservatism must be observed, lest an occasional untoward result overbalance good, to the detriment of the agent itself. So far, however, accidents have been few, which is really marvelous considering the recklessness with which the Roentgen ray has been handled.

Many requests have been made at different times for a description of the technique employed in treating these cases. To describe such technique is a task made more or less difficult, first, by the fact that every case is a unit of personal equation; and second, that there must be a variation with the different forms of apparatus used. After a certain amount of employment of the apparatus at hand, the operator will be able to judge with a considerable degree of accuracy, the amount of X-ray that it is capable of giving.

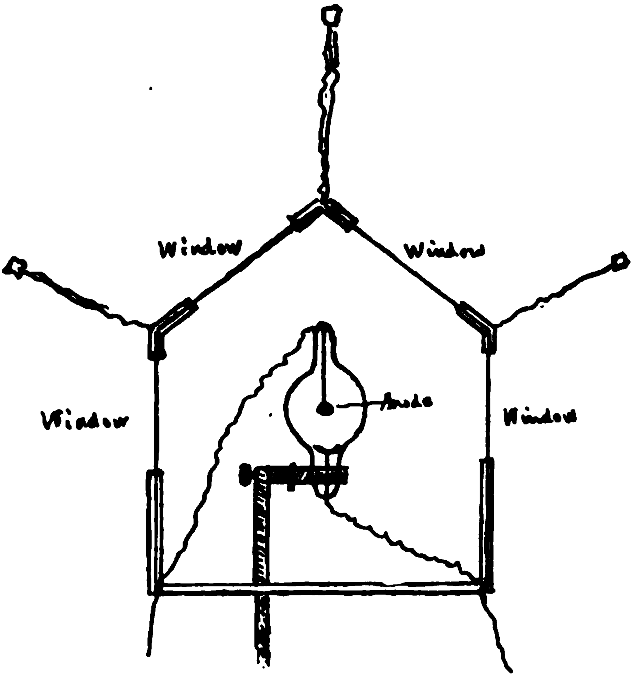
In undertaking the treatment of a given case, we must consider if it is necessary to produce a reaction, and in some instances even *decided reaction*, or a burn. In many cases, however, this reaction, at least that of hyperemia, is not necessary, and no doubt in some, it results in harm. This is well exemplified in cases of superficial epithelioma that usually heal readily, without the so-called *burning*. Some failures no doubt may be attributed to burning, the argument for this being based upon the fact now well established, that long continued X-ray irritation will produce epithelioma, and that cases have been reported where the epithelioma has occurred in the burn. Therefore it is rational to believe that these cases of epithelioma must not be treated too vigorously, nor yet too long. Another cause for failure in the treatment of these superficial cases is the lack of surgical assistance. They should also be treated as any other ulcer, with proper washings and dressings, the occasional application of blue stone or luna caustic when indicated, and the use of zinc ointment in the presence of a decided dermatitis. Supplemental treatment therefore must be adapted to the various conditions as they arise.

The prognosis in these cases depends upon a number of conditions which at the present time prevent the dictation of hard and fast lines. From clinical observation it is apparent that carcinoma in its various forms is more malignant in the young and robust, than in the old and anemic; the *raison d'etre* we must await until the pathologist gives us the cause of cancer. It is, however, well known that the form of cancer that develops upon the face is usually very chronic, many of these cases having histories which extend over thirty, and some even forty years; and even after so many years it is very rare to observe metastasis to other parts of the body. On the other hand carcinoma developing in the orbit presents quite a different history. From the time of first observation to the death of the patient, is often only two or three years (without interference) and metastasis is usual. Thus it is, that the belief is broadcast, that the X-ray will act very well upon the superficial growth, but not upon the deeper one. Yet, at the same time, all have heard that this same X-ray will cause fatal blood and kidney changes, sterile ovaries and sterile testicles. Many cases have, nevertheless, been reported and observed in which deep tumors have disappeared under X-ray treatment, and in those instances where it has failed, the cause was due to the disease being of a more malignant type. This difference in malignancy is well illustrated in scirrhus of the breast. Developing about the age of forty, the disease will usually terminate fatally in from three to five years; developing at seventy, it rarely causes death. In those cases where the disease has made such progress that the patient's vitality, or the vitality of the part has been greatly impaired, good results from the X-ray are certainly not to be expected, but at the same time, it will often retard the process, and give both physical and mental comfort.

While the X-ray under many circumstances will act favorably upon tissue, it must be remembered that at times its action may be the reverse. Especially is this to be found where some serious kidney lesion exists, when it will often cause extensive local tissue change, or in some a fatal toxemia. Upon this question there is, however, a decided need for enlightenment, but all these points must nevertheless be fully considered before undertaking to treat a given case.

The technique to be adopted in this field of work depends largely upon the apparatus at the disposal of the operator, and before considering the treatment of any one disease, it would be well to consider a few general points. The most efficient form of apparatus for all X-ray work is the coil operated on the direct current. For treatment alone, one may use a static machine, or even a transformer, and obtain equally good results, while the cost of maintenance might be decidedly less. The X-ray tube must be balanced according to the current used, but should by all means possess a regulator for the vacuum, and all tubes should be encased in a shield that will only allow the rays that are in use to escape, and while instruments for recording the *amount* of current flowing through the apparatus might be desirable, they are by no means accurate and add greatly to the cost of the apparatus, while they have absolutely no effect upon the results. Where a number of cases are to be treated, considerable time as well as expense can be saved by treating several at once, which can easily be accomplished by the use of a screen, as shown in Fig. I.

A five-sided structure is made, the frame being of wood; four of the sides are arranged as an incomplete hexagon, and the fifth is left open. (Fig. 2.) The four sides have a com-



(Fig. 2.) Anode is set about 10 degrees below the lower edge of the window. This insures all sides getting the same quality ray. It must be remembered at times that the glass of the tube differs in thickness.

mon center within the enclosure, of nine or ten inches, and are covered with zinc (containing considerable lead). In the sides windows are cut, and over these windows are fitted the individual screens for the different patients. At the common center the anode of the X-ray tube is placed, so that the four windows will receive an equal amount of X-ray, and if it is desired to increase the distance between the patient and the anode, this is easily done by moving the tube further back; and if it is desired to decrease the distance it can be done by moving it forward. The fifth side is left open to operate the tube, and at the same time, one can see if the patients are properly adjusted. The four cases to be treated at the same time should be of the same type, but the difference in the resistance of the individual may be controlled by variations in the length of time, distance between the patient and the anode, etc.; and even if it is desired to treat a deep case with three other superficial cases, this can be done by covering the window with leather, which will to a very great extent cut out the low ray, and prevent surface burning. It has been found that it is not best to push the tube, as by using it moderately the vacuum will be decidedly more regular, and its life will be greatly prolonged.

The general plan adopted in treating these cases has been to give a few preliminary exposures to test the personal equation, and in several instances an idiosyncracy to the X-ray was disclosed that would have been dangerous had daily treatments been given. Usually the patient receives two treatments the first week, then three the second week, and the third week daily treatments are given if there be no contra-indication. This is continued until there is marked evidence of improvement, when the exposures are cut down to one, two or three a week, as the occasion may require. At the slightest evidence of burning, it is best to stop the treatment at once. While this is the routine that is to be desired, modification must be made to suit the individual case, and this is perhaps best shown in a short resume of a few cases in which irregularity is practically demonstrated.

Miss X., 79 years. Epithelioma of lower eyelid, several years duration; ulceration about ½ inch in breadth, 1½ inches long, and about ¼ inch deep; ectropion was marked. The x-ray treatment began 7-14-'02, ten minutes exposure each time, fairly low tube. Treatments followed, 15, 16, 17, 18, 19, 21, 22, 23, 28. On August 4th, the ulcer was healed except a small area at outer end about the size of a pea. Treatments of five minutes were given Aug. 4 and 25, Sept. 1 and 8. About a week later the healing was complete, and when last heard from about eighteen months ago there had been no recurrence.

Mrs. W., 62 years. Epithelioma of the right orbit extending on the forehead, to within one inch of the hair line, and involving most of the right nose, as well as the right cheek; there was also considerable necrosis of the bones of the orbit. It originated 22 years ago from a small wart on the lower lid. In February, 1902, Dr. H. R. Wharton curetted the ulcer, and this was followed by a bi-weekly treatment during March, April and May. Healing of the ulcer followed, except around a sinus leading to the frontal cells. In August, 1902, there was considerable granulation tissue protruding from the sinus, and eczema about the opening leading into the nose from the orbit. Irregular treatment was given, as the woman's health was too poor to permit regular attendance, and no result whatever was forthcoming. But during February, 1903, she received five treatments, and was also treated March 10, April 9 and May 5, with the result that the lesion returned to its former condition. She received a few scattered treatments, some months as high as six, until October, 1904; but during the winter of that year, and most of the year following, her general health was very poor. In the fall of 1905, however, it was noticed that the disease was recurring in the posterior nares, and irregular treatments were again given, but with very slight effect, and death followed in April, 1906. This case was of the greatest interest on account of the great amount of tissue involvement, which remained in good condition until about six months before her death, in spite of her poor general condition due to the heart and kidneys, which gave her considerable discomfort.

H. McN——, 56 years. Recurrent carcinoma in the scar; operation five months previous. Treatment began December 4, 1902, followed 8, 10, 12, 15, 17, 18, 19, 22, 23, 24, 29. Last account about a month ago still in good condition.

M. S. M——, 54 years. Epithelioma of the lower eyelid extending downward, about the size of a ten-cent piece, and about ½ or ¾ of an inch deep. Treatment began March 24, 1903, followed 27, 28, 30, 31; April 1, 4 and 8. As there was considerable reaction, treatment was stopped. Applications of zinc ointment, with some camphor and boric acid were given. On May 5 the treatments were resumed, but were cut to five minutes, and continued 8, 11, 13, 15, 18, 20, 27. Again there were signs of burning, and the ulceration was worse than when the treatment began. On June 15

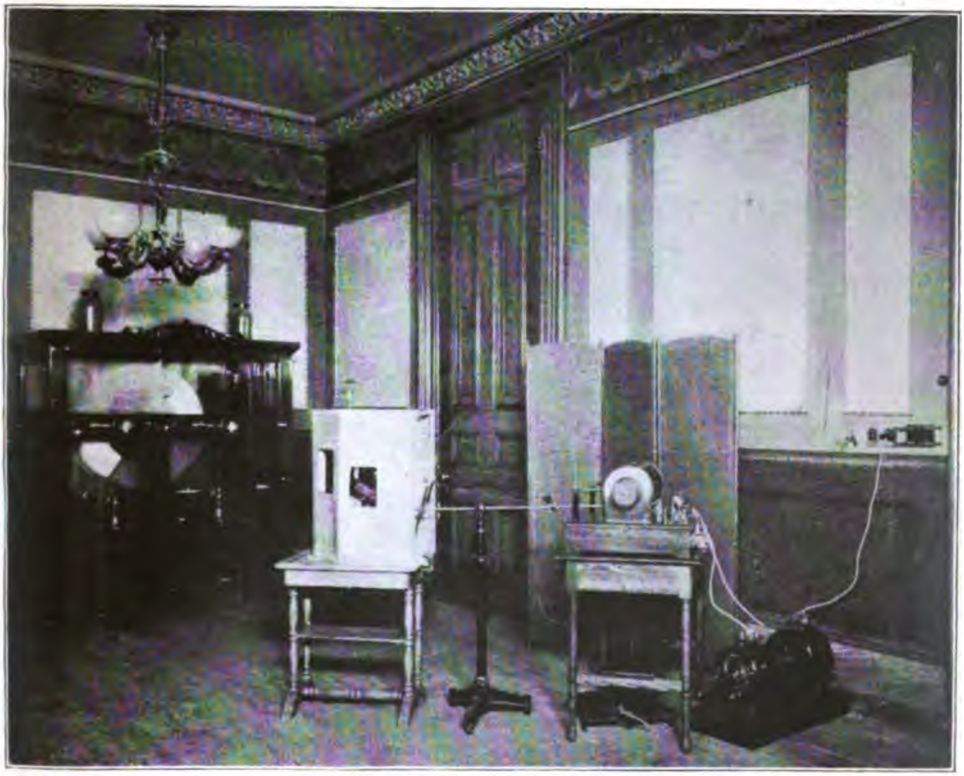
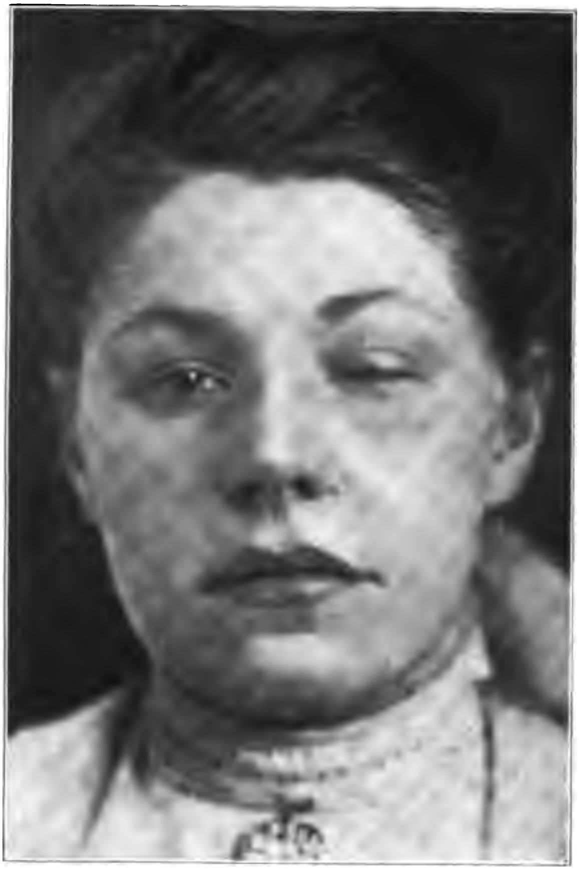


Fig. 1.



Trachoma with Pannus. O. D.—after treatment, O. S. before treatment both eyes were originally equally affected. (Newcomb.)

treatment was again resumed with three-minute exposures, followed 17, 19, 22, 24, 25, 26, 29, 30 and July 1. After this course, healing followed, and when last seen about six months ago, the parts were still sound. This represents a class of cases in which the treatment must be very mild, lest the ray cause more trouble than the disease, but if handled gently healing usually follows.

G. S——, 68 years. Ulceration extended from the lower portion of the nose half way across the forehead; both eyes were involved; began on the upper left eyelid thirty years previous. Patient died while under treatment from pneumonia, but at time of death the ulceration had healed in about one inch.

E. S——, 58 years. Ulceration below left eye; eleven treatments; healed.

J. E——, 64 years. Several small ulcers about left eye; nine very irregular treatments. Result: Cured, ulceration healed.

M. R——. Ulceration about the size of finger nail, lower lid. Treatment began July 3, 1903, followed 4, 6, 11, 13, 16. The patient had to discontinue treatment on account of illness, but the ulceration healed. In the spring of 1905 it again recurred, but only one-quarter of the original size. About ten treatments were given in the course of three months, with the same good effect. Again, in the spring of 1906 it recurred. Since that time ulceration has continued, but has not increased in size. Scattered treatments only were given, on account of her general condition, as regularity is impossible.

W. W——, 68 years. Ulceration about the size of a pea around the inner canthus; sixteen treatments very irregularly given, between July 20, 1903, and August 26, 1903. Healed.

In another interesting case treated, the original disease was of the left lower eyelid. About two years later he returned with an ulcer on the right temple, near the eye; the original site was not involved.

The above cases illustrate the necessary departures that often have to be made from the regular routine, due to one cause or another, and tend to show that as long as there is not an overstimulation of the diseased area, healing is likely to follow; but the moment there is an excess of the x-ray, the ulceration is likely to be aggravated. On the other hand, too little x-ray is very liable to be followed by recurrence. It is also interesting to compare the difference in re-

resistence, as most of these cases received their treatment from the same tube at the same time.

In TRACHOMA, the x-ray must be pushed to the extent of a mild burn; otherwise it is impossible to relieve the condition. The action of the ray might be compared to a deep curetting, without the removal of the healthy tissue. One might think that the violent inflammatory reaction that often follows would do harm to the more sensitive structures of the eyeball; and while theory might also support this view, practice has proved otherwise. In the x-ray we have a soft ray that acts only upon the surface; then, too, a hard ray that penetrates, and perhaps if the last one were used long enough we might do harm to the more vital structures. In most eye conditions that call for treatment it is the soft or surface ray that is to be desired. The same is also true in nevi; the burn must be pushed to an ulceration. Macula also calls for a burn, but while a slight burn will often clear it to a great extent, if it is pushed too far, it is likely to result in harm.

The principal difficulty encountered in treating trachoma has been the irregularity of the patient's attendance. Here, unlike the epithelioma class, the routine must be followed by the utmost precision, and no doubt this has been the cause of many failures. The burn that is produced by the ray must be sufficient to cause degeneration of the granules, and not enough to disturb the healthy tissue. In cases where pannus co-exists, treatment must be still more vigorous, sufficient to cause contraction of the blood vessels. A case that illustrates this point was reported before the Philadelphia County Medical Society, November 23, 1904. Another case illustrating the difficulty of obtaining the proper burn was a man 44 years old, who received forty-eight treatments, which, although scattered, yet produced considerable reaction. The result was negative. His tolerance of the ray was remarkable.

The following cases illustrate a decided intolerance. Mrs. J. S——, 32 years. In November of 1903, Dr. Wm. M. Sweet removed a tumor from the face just below the inner canthus of the left eye, about one inch in diameter. Microscopic examination showed it to be of tuberculous nature. A sinus followed which refused to heal. In the spring of 1904 she was given a few x-ray treatments with no result. At this time other patches of ulceration developed above the eye brow, and about the alae of the nose. On August 10, 1904, x-ray treatment was again tried, each treatment being ten minutes, and continued 11, 12, 13, 15, 16, 17, 19; it was then reduced to five minutes, 20, 22, 24. This was followed by an intense inflammatory reaction over the whole face and part of the scalp, which lasted for about four weeks, but after subsidence the ulcerations were decidedly improved. On October 14, 1904, treatments were again resumed, but were only of two minutes duration, followed 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 31, November 1, 3, 4, 5, 6, 11, 15, 16, 17, 18, 21, 22, 23, 25, 26, 28, 29, 30, December 1, 2, 3, 5, 6, 7, 8. These treatments resulted in a complete healing of all ulcerations, and when last heard from they were still in good condition.

The above resume represents most of the variations that one is likely to meet in this field, and while the question of how much x-ray will a given case require is often asked, no definite answer can be given, as the circumstances are so varied that it is impossible to give any exact detail. It is a matter of judgment, and for the same reason it is impossible to translate it to text books.

3501 Baring St.

THE SURGICAL TREATMENT OF TRACHOMA.*

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TORONTO.

I am induced to offer this paper, not because it contains anything very new, but for the purpose of taking advantage of the presence of so many distinguished men in our department of medicine to obtain an expression of opinion on the surgical treatment of trachoma, and to promote a discussion on this important subject. I think that it will be admitted that a disease so widely diffused, so serious in its effects, and so difficult to completely cure, well merits our best consideration.

I would first recall, briefly, the history of the surgical treatment of trachoma. So long ago as Hippocrates, granulations of the eyelids were excised, rubbed and cauterized with a hot iron or caustics, and there treatment practically remained until the middle of the last century.

It was Van Lil, who in 1849 observed that granulations hidden under the upper lid, in the cul de sac, not only escaped treatment, but the notice of the surgeon altogether, and were the causes of relapses. Pilz of Prague, in 1854, incised the granulations with a cataract needle, and squeezed out the contents. Sometimes also he practised scarification, and followed it up by using sulphate of copper. Borelle recommended a brush, and Anagnestakis a metallic rasp. Galvano cautery, thermo-cautery and electrolysis have also been used extensively, and have their advocates. Galozowski and others have excised larger or smaller portions of the conjunctiva. Expression by means of the roller forceps and similar instruments has been practised extensively by Knapp and others, and Bardenhauer advocated the use of a sharp curette. Sattler after a study of the work of those preceding him, adopted scarification of the granulations by a cataract needle, and expelled the contents with a sharp curette. He devised a special form of forceps for completely everting the upper lid, and exposing the cul de sac. He made a point of destroying each and every granulation, and after doing so, washed the eye thoroughly with sublimate, 1-1000. He continued the use of sublimate for several weeks and then used copper, and afterwards tannin.

Darier has modified and improved this method in the following manner. During chloroform anesthesia, for these cases can rarely be done under cocain, he cuts with scissors the external angles, if the lids cannot be completely everted. This procedure is called for in about 30 per cent of the cases, but sutures are rarely required afterward. If the caruncle is much infiltrated he removes it with the scissors. The brossage he begins on the lower lid to avoid being inconvenienced by hemorrhage from the upper. A special form of forceps is used to evert the lid, which is seized about 2 mm. from its margin. The scarification is then made with a three-bladed knife, so as to divide every granulation. If the latter are few and discrete, a discission needle is used. The scarifications cause the gelatinous material to escape on the conjunctiva, and care must be taken not to allow it to remain on the wound. After thorough scarification, and curettage if needed, the lid is thoroughly brushed with a tooth brush. The brush should be hard and carefully disinfected by immersion in formol-alcohol, and then in a solution of sublimate or cyanid of mercury 1-1000. The brushing should be done with a solution of cyanid of mercury 1-1500, and should be done vigorously. Considerable reaction follows this strenuous treatment, as shown by edema of the lids and conjunctiva, but the reaction is not as great as one might expect. It can be satisfactorily combatted by iced boric acid solution, but better still by a lotion composed of *Sol. Plumbi Subacetatis dr. 1 Tinct. Oppii oz. 1 Spr. Vini rect. oz. 1 Aq. Dest. ad oz. viii.* The eyes should be gently douched with warm boric acid or normal salt solution, and cocain and adrenalin solutions instilled. The eyes should not be bandaged, but shaded only, so as to permit free discharge.

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*Read at the Toronto Meeting of the British Medical Association, August, 1906.

The successful use of grattage is dependent upon several circumstances.

1. *Choice of the Case.* It must not be thought that this radical method of treatment is applicable to all cases. The milder forms of trachoma do very well under medicinal treatment. In old atrophic trachoma, grattage is well nigh useless. My experience is that the best results are obtained in the severer forms of papillary or *"false"* granulations. The *sago grain* or *"true"* form is benefitted, but in my opinion requires several repetitions, and prolonged medical treatment.

2. *Thoroughness With Which the Treatment Is Carried Out.* A single granulation may act as a center for reinfection. Too much care, therefore, cannot be exercised in

treating each and every granulation. Isolated granulations should be thoroughly curetted.

3. *The Operation Should be Followed by Persistent Medication.* The operation shortens the duration of the case by months, and perhaps years, but is not in itself curative. Solutions of cuprol, cuprocitrol, protargol and argyrol, and murcurol, in powder form, should be regularly used. Afterwards nitrate of silver, which is still far from being useless, can be applied. It has not been entirely displaced by the newer remedies, and should be used in solutions (gr. XX to LX) in préference to solid form.

In conclusion I would say: 1. Operative treatment is not indicated in all cases; 2. Operative treatment should be followed by persistent medication; 3. Operative treatment, both expression and brossage, when thoroughly done, greatly shortens the course of the disease; 4. The papillary form of trachoma is most successfully treated by Darier's method in conjunction with medication.

66 College Street.

A CASE OF DOUBLE EXTERNAL RECTUS PARALYSIS, TRAUMATIC IN ORIGIN.*

HOWARD F. HANSELL, M. D.,
PHILADELPHIA.

S. L——, a laboring man, 31 years of age, was struck on the head by a large block of ice weighing perhaps 50 pounds. The scalp over the posterior part of the parietal bones and the superior part of the occipital bone was torn away from the skull over an area of about 2½ inches square. He became unconscious almost immediately after the accident, and regained his consciousness only after 12 or 14 hours. For the next three weeks he complained of pain at the site of the injury and constant headache, but he was not delirious nor deprived of any of his senses. At the termination of the three weeks, while the headache persisted, he commenced to have diplopia for all objects, distant and near, so marked that he was unable to travel alone. The diplopia, and the dizziness and bewilderment dependent upon the diplopia continued without amelioration until I saw him six weeks after the accident. The history points to a sudden onset of diplopia, but it is possible that the patient's mental condition and the confinement to bed prevented its earlier recognition. Each external rectus muscle was almost completely paralyzed. He could rotate each cornea externally but a shade past the median line, and had double vision in all parts of the field. He fixed with either eye indifferently, and had full visual acuity in each eye. Excepting for the pathologic convergence the eyes were normal in every respect and there was no associated paralysis of any other of the cranial nerves. The diplopia was homonymous with no appreciable variation in the horizontal level of the two images.

Traumatic paralysis of both sixth nerves is rare. Ahlstroem (*Beit z. Augenh.* 1899, Vol. 5) found in the literature from 1870 to 1899, 112 cases of traumatic paralysis of the motor nerves of the eye to which list he adds nine cases of his own. In none were both abducens affected without involvement of one or more of the other cranial nerves. He mentions 73 cases of simple abducens paralysis and others in which the sixth nerve was paralyzed only in association with other ocular nerves, or with the facial nerve on the same side. In all but two the paralyzed muscles were on the same side of the head as the blow which caused them.

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*Read before the Section on Ophthalmology, College of Physicians of Philadelphia, October 16th, 1906.

Omitting from consideration the rupture of a muscle or its forcible separation from the sclera by direct injury, the most common cause of the paralysis has been a blow with a stick on the same side of the head as the affected muscle, or a fall by which the head is brought violently into contact with ice, or a hard pavement. The question of greatest clinical interest is the determination of the immediate cause of the paralysis. Since post-mortem examinations can seldom if ever be made until such time has elapsed after the accident that the original lesion is buried under subsequent pathologic changes, the nature of the cause of the paralysis must be more or less speculative. That the sixth nerve is affected at the base of the brain more frequently than other nerves, is explained by most writers by reason of its long course. Emerging from the external side of the olivary body it lies between the brain substance and the skull until its passage through the sphenoidal sinus, and is more exposed to injury from sources without the skull, and to pressure from tumors or exudation from disease within the skull, than any of the other nerves. In the above and similar cases, nuclear, fascicular and cortical lesions may properly be excluded. We could hardly conceive of a hemorrhage or exudation so fine that it concerned only the nucleus, and so placed that both nuclei were equally and simultaneously affected; nor one that practically destroyed the intercommunicating fibers and confined its action to them. As Bernheimer points out, the nucleus of the sixth nerve lies much further back on the floor of the fourth ventricle than the nuclei of the third and fourth nerves, and each nucleus is but slightly removed from the median line, and is in close proximity to the nucleus of the seventh. It has been shown that the nuclei give out two series of fibers, one to form the sixth nerve on the same side, and the other to cross over to the original fibers that go to make up the sixth nerve on the opposite side. A lesion therefore sufficiently gross to destroy the nucleus of either side, would almost necessarily involve the seventh nerve nucleus, and an affection of the long bundles of fasciculi—one on each side—without destruction of other fasciculi or nuclei, particularly of the fith and seventh, would be almost inconceivable.

The double paralysis should not be confused with a conjugate paralysis, or a paralysis of divergence, the latter a condition extremely rare and difficult to explain. External rotation of the globes is preserved in conjugate paralysis of lateral movement to the right or left, and may be demonstrated, provided that the movement can be induced as an independent or isolated one, and not in conjunction with the simultaneous action of the associated muscles of the other eye. In other words, the power of the muscle is unaltered, the conductivity of the nerves is normal, and the nucleus functionates, but somewhere in the cortex, where mental conception normally first instigates, the lesion prevents the earliest response to the command, and the function of the other parts of the apparatus is held in abeyance. Paralysis of divergence differs materially from any of the forms of paralysis classified in the books as conjugate palsies, and if described at all is considered only in the symptomatology of hysteria. Duane, in *"The Eye and Nervous System,"* says "the derangements of the associated parallel movements (conjugate paralysis, conjugate spasm) are paralysis and spasm of the parallel movements, and tremor and ataxia of parallel movements." De Schmeinitz (*ibid*) says: "Just as convergence insufficiency may be replaced by an actual convergence-paralysis, so also a divergence-insufficiency may be replaced by an actual divergence-paralysis, as Parinaud, Uhthoff, Straub, von Hippel and many others have noticed. It therefore becomes evident that in hysterical patients all of the factors may be defective, accommodation, fusion and probably also the *sense of convergence,* and we may have an absolute or a relative weakness of the abductors, or a disturbance of central origin which creates a weakness or a total disappearance of the power of fusion." Paralysis of divergence, then, can be rationally explained only by hysteria or some other unknown affection of the cortex. I have briefly alluded to the nuclear and cortical forms of paralysis of divergence in the study of this case of bilateral traumatic paralysis of the abducens, in order to bring out the essential points of difference in the pathology between paralysis of muscles and palsy of a function.

The lesion in the case cited above was undoubtedly situated at the base of the brain at the superficial origin, or in the course of both sixth nerves. Its exact nature is uncertain. The man had few of the usual symptoms of fracture of the skull, and the delayed appearance of the double paralysis until three weeks after the injury would also militate against fracture as the diagnosis. For the same reason it is improbable that the sixth nerves were compressed by hemorrhage occurring at the time of the accident. The most plausible explanation would seem to be that the nerves were gradually pressed upon by the exudation of meningitis, or that the inflammation at the base incited by fracture of the skull or by the presence of blood or serum extended into the nerves themselves. Bernheimer (*Second Ed. Graefe-Saemisch*) states the pathologic process which leads to paralysis of the nerves to be as follows: "Those forms of meningitis that are characterized by exudation in considerable amount are particularly inclined to give rise to paralysis of the eye muscles. The exudate collected at the base, and especially in the neighborhood of the chiasm, of the motor oculi, and, still deeper, in the neighborhood of the abducens, is in itself an irritation, and an exciting cause of inflammation. It induces perineuritic changes in the nerves which may end in the destruction of the nerve tissue. At first the symptoms are those of irritation, but after a long continuance of the disease, when, through inflammation and connective tissue increase, atrophy of the nerve fibers ensues, paresis and paralysis take the place of irritation." The same author, in another volume, explains the pathology of ocular palsies after injuries in which the skull has been fractured. When the fracture involves the foramina and canals carrying the nerves, tearing or stretching of the nerves leads to transient or permanent paralysis. Under certain conditions, the nerves are torn at the same time the bone is broken, or they can be stretched by the subsequent separation of the fragments. Fractures of the sphenoid may very easily by separation of the clinoid processes destroy the function of the third or fourth nerves on the same side.

The diagnosis of paralysis of each abducens in the case of my patient presented no difficulty. The homonymous diplopia, the loss of the power of outward rotation, fixation with either eye when the gaze was directed straight in front, and with the left eye when the object was carried to the right, and with the right when the object was carried to the left side, and the tilting of the head to one side or the other according to the eye used for fixation, were all characteristic.

The value of medicinal treatment is problematic. The remedy usually prescribed, potassium iodid, may be helpful in cases of paralysis from exudation or hemorrhage, but in inflammation of the nerve itself, its efficacy is doubtful. Operation can be recommended only in cases of long standing, and then for cosmetic purpose. A shield worn over one eye to exclude the participation of that eye in the visual act is useful.

In recent cases, the prognosis is favorable; in old cases there is little hope for relief.

1528 Walnut Street.

EMBOLISM OF A CILIO-RETINAL ARTERY; LOSS OF ONE EYE THROUGH GONORRHOEAL CONJUNCTIVITIS; ENDOCARDITIS; SEQUELAE OF GONORRHOEAL URETHRITIS.*

WILLIAM ZENTMAYER, M. D.,
PHILADELPHIA.

On the eighth day of August, 1901, J. J——, aet. 16 years, was seen by me in consultation with Dr. William H. Teller. The patient had gonorrhoea, and 12 days previously had infected the left eye. Up until the time of the consultation he had been under treatment at a dispensary.

Examination showed very slight swelling of the lids; intense bulbar and tarsal congestion with a moderate amount of purulent discharge. The cornea over the lower inner third was destroyed down to Descemet's membrane. The anterior chamber was empty.

Hot compresses, atropin, boric acid wash, frequent instillations of a 5 per cent. solution of protargol and daily application of a 2 per cent. solution of nitrate of silver were ordered. An unfavorable prognosis was given.

He was again seen September 2, when there was present, at the sight of the previous ulceration, a staphyloma of the cornea of the size of a white bean. A compress bandage was advised. Two weeks later the staphyloma had flattened to the level of the surrounding cornea.

On July 13, 1903, he returned with secondary glaucoma, the anterior chamber being filled with blood. Eserin was ordered, but at the end of 48 hours, pain still being intense, a Mules's operation was performed. The reaction following the operation was so great that the glass ball was removed. He made a good recovery. Nothing more was heard of him until June 15 of this year, when he returned complaining of a large black spot which had appeared suddenly before the eye, six days previously, and had persisted. V. = 6/VI.

Ophthalmoscopic examination showed clear media, round disk and obstruction of the circulation in a cilio-retinal vessel which emerges from the disk at the upper third of the temporal margin. Just below this vessel there is a superficial hemorrhage. The opaque area is of about the width of the disk and corresponds accurately with the territory supplied by the affected vessel. The upper margin of the opacity is less sharply defined than the lower, which has a festooned outline, the most dependent part coresponding to the terminals of the arterial twigs which come off from the vessel. The affected vessel is in part blood-bearing. For a distance of about one disk's diameter outward from the disk it is extremely narrow, beyond this it is of a fair calibre. Macular branches from the superior temporal artery cross the opaque area, and on both sides of each of these vessels there is a band about the width of the vessel, from which a pink reflex is obtained. The superior temporal vessels are somewhat engorged.

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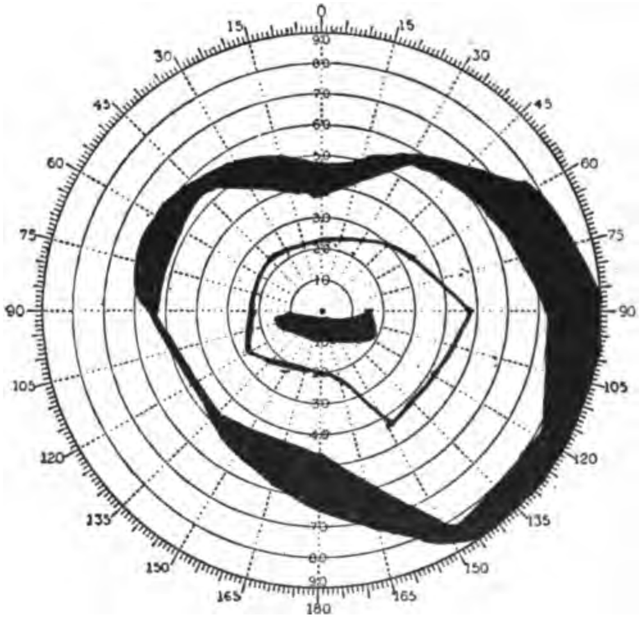
*Read before the Section on Ophthalmology of the College of Physicians, Philadelphia, October 16th, 1906.

In the visual field there is a scotoma about five degrees in width situate below the horizontal meridian and extending from 10 degrees to the nasal side of fixation to the blind spot.



At present the area formerly opaque is hazy, and the lower margin is still fairly well defined, but with the ophthalmoscope the whole behaves like a retinal reflex. The underlying epithelium has a honeycombed appearance. The cilio-retinal artery is very narrow up to the point where the embolus lodged, but beyond this it is of normal size. The outer half of the nerve is pallid. The scotoma is unchanged and (V. = 6/VI) Dr. Teller reports that the examination of the heart shows presystolic murmur. The blood examination shows 5,000,000 erythrocytes, 9,000 leucocytes and hemoglobin 80-90 per cent.

An interesting condition was the reflex from the chorioid on each side of the branches of the superior temporal artery where these vessels crossed the opaque area of the retina. The reflex was not so deep a red as that obtained from normal parts of the fundus, but was rather of a pinkish hue. It was about of the width of a main branch of the central artery of the retina. It may have been due to the pressure of the vessels, or to the fact that the union of the fibres of the fibre layer about the vessels prevented the serum reaching up to their sides. The thought at first occurred that the transparency of the retina was here maintained because its nutrition was supplied by these vessels in which the circulation was undisturbed, and this view has not been entirely vacated because it seems strange that if the opacity in the retina resulting from obstruction of the circulation is an actual edema, that this edema should be so accurately limited to the area supplied by the obstructed vessel, as it is in this case, as it is in cases of branch embolism and as it is in cases where the central artery has been obstructed, but the presence of a cilio-retinal vessel has modified the appearance of the usual picture by the preservation of a transparent and functioning area of the retina corresponding to the region supplied by this anomolous vessel. Frost, while giving no reason for his opinion, states that the opacity is probably of the nature of a post-mortem change rather than a true edema, and this view would seem to receive support from the above facts.

In speaking of the cause for a rarity of embolism of the central artery of the retina, Ball says that "if an embolus gains access to the ophthalmic artery it is much more likely to traverse the lacrimal, supra-orbital, naso-frontal and their terminal vessels (the ciliary arteries) than the retinal artery. It is probable that embolism of the ciliary arteries is a more common affection than has been supposed; however, owing to free anastomosis, plugging of one of these vessels is not followed by such disastrous effects as follow embolism of the central artery." In the case reported above the embolus probably entered by way of the ciliary vessels as cilio-retinal vessels usually come off from the circle of Haller. Had there been no cilio-retinal vessel present, the fact that there had been an embolus swept into the circulation would likely never have been known.

The sequelae of this case of gonorrhoea, namely, total loss of one eye, endocarditis and serious impairment of vision in the remaining eye, form a sad commentary on the one-time almost universal teaching and the prevailing view of the laiety that gonorrhoea is a harmless affection causing, at the worst, a more or less troublesome local condition.

1819 Spruce Street.

OPERATIVE, POST-OPERATIVE AND TRAUMATIC INFECTIONS OF THE EYE, INCLUDING THOSE ARISING FROM INSTILLATIONS AND INSTRUMENTS.

HOWARD F. HANSELL, M. D.,
PHILADELPHIA.

The prevention and treatment of infection of the ocular tissues following operation upon the eye and its adnexa has been the aim of operators since the time Lister announced the causative relation of poisonous germs to purulent inflammation. Bacteriological studies, begun with enthusiasm and continued with avidity and eagerness, have resulted in enormous increase in our knowledge, and while no special germ has been found to be responsible, the great principle that germs, resident in the conjunctival sac, or introduced by unsterile hands, instruments or washes, or already existent in other organs of the body than the eye, originate post-operative disease, has been abundantly proven. The older surgeons in active practice in 1878 could not uniformly accept the new theory, which meant the downfall of their ideas and principles without stronger evidence than could be procured in those ancient days. I remember very well Prof. S. D. Gross's lectures on the subject of the carbolic spray and other antiseptic practices. He believed and taught his classes that much of the new fad was foolishness and insisted that the preventative agent was cleanliness, not asepsis—of the operator and patient. He recognized at least that germ of truth, and never failed to observe its laws. No operator of today needs more convincing proof of the value of antisepsis than is furnished by his own experience. If he should, let him compare the results of the surgery of thirty years ago in the battle-fields, in the army hospitals, in the city hospitals, or in private practice. Let him consider the value of the prevention of disease by methods emanating from the laboratories of bacteriologic research as illustrated in the deaths from disease and bullets in the Spanish-American war, and bullets and disease in the Japanese-Russian conflict. Both were conflicts of recent times, but in one too little attention was paid to prevention, and the death rate from disease was four, while that from bullets was one. In the other, where sterilization and antisepsis were rigidly carried out by both officers and men, the death rate from disease was one, and that from bullets four. And I venture to predict that should civilized nations again resort to arms to settle their differences the methods of the Japanese will be imitated, or, as our knowledge increases, surpassed.

1. *The Prevention of Infection.* Before the days of antisepsis, operative failures were attributed to faulty technique, lack of skill on the part of the operator, unruliness of the patient, or local or constitutional complications. Speaking of failures, Arlt said in 1879: "This result depends upon circumstances over which we have no control. We will have, after operations performed with consummate skill, a percentage of losses in which sometimes the fault lies either with the surgeon or the patient, and sometimes, without discernible cause, the eye is lost."

Should the inflammation, at first superficial, go deeper, the vitreous becomes purulent throughout, and then an edematous swelling of all tissues ensues. The picture of panophthalmitis is before us. The pus in the globe after a painful period of time finds spontaneous exit through the ulcerated cornea, or perhaps through the sclera if a timely incision is not made. Snellen, in the second edition of Graefe and Saemisch, forty-eighth band, published in 1902, says: "I bring this striking description of Arlt to your remembrance because this process practically belongs to the past, and because the younger ones among us so seldom have the opportunity to be face to face with this sad condition." By the modern day elimination of the cause of infection by sterilization, we are permitted to report infinitely fewer disasters following operation. The other factors in the production of failure, mentioned above, prevail to-day as in ancient times. The personal element is ever among us acting for good or evil. By education, by experience, by the recognition of our own limitations and by reflection on our own failures, we may look for a still higher ratio of successes than we now enjoy.

2. *The Hands of the Surgeon.* The best method of rendering the hands sterile has been the subject of many essays by our German colleagues, not only oculists but general surgeons. While it is true that the hand or any part of it seldom comes in contact with the tissues in operation about the eye, it is none the less essential that the hands be made both clean and sterile. The sterilization of instruments, dressings, etc., would lose much of its value should they subsequently be reinfected by germ-laden fingers, and again, occasion may arise when the instruments are laid aside and the fingers used. The question, "How can one most surely render the hands free of germs?" is thus answered by Snellen: First, by care of the hands by abstinence from heavy work, from which the skin

may become rough and eczematous, and the epiderm cracked; second, by never touching infectious material; third, by a disinfection which consists of three phases—(a) mechanical cleansing by thorough and intelligent brushing of the hands and nails with hot water and soap for five minutes; (b) brushing the hands and nails with alcohol for three minutes; (c) brushing the hands and nails with 1-1000 bichloroid solution for one-half minute. The hands should not be dried before operation. These directions seem to cover the ground completely, and if followed out consistently it is highly improbable that the hands will carry infection to the seat of the operation. It may not be out of place to say a word in this connection concerning the hands of the patient. It is a matter of importance that the patient be instructed in no uncertain manner not to touch the operated parts. I performed an advancement operation on the ocular muscles of two girls in the Philadelphia Hospital. The operations were similar in every respect, done successively in an afternoon, and under precisely the same surroundings. One of them recovered rapidly and normally. The other disturbed the bandage and touched the operated eye with her fingers. Infection thus communicated incited inflammation that for several days threatened the loss of the eye. My method of sterilization is practically that given above; a thorough scrubbing with tinc. green soap or etherized soap, a soaking with bichloroid solution 1-2000, and finally a wetting with alcohol.

3. *Preparation of Patient.* In preparing for cataract extraction, iridectomy or other operations involving opening the globe, the patient is given a warm bath the night before operation; the face is scrubbed with soap and water, washed with alcohol and dried. Bichlorid ointment after the formula suggested by T. A. White of Richmond, Va.,* is freely applied to the conjunctival sac and lids. The nostrils are douched with perman. of potass. 1-1000. This last procedure is repeated the next morning, and a double sterile bandage applied two or three hours before operation. A careful examination of the patient's physical condition is made and reported to me. Skin eruptions, eczema, acne and other like conditions should also be rendered as far as possible aseptic.

4. *Sterilization of Instruments.* Many methods are used to render the instruments surgically clean, among which are im-

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*Bichlorid of mercury, gr. 1; sodium chlorid gr., v.; vaseline, ounces 6. The vaseline is boiled; the bichlorid and salt are dissolved in a few minims of water and added to the boiling vaseline. After boiling, the bichlorid and vaseline, 1-3000, is put away in jars until used.

mersion in carbolic acid solution (Lister's method), dry heat, steam, lysol, creosol, boiling in weak acids, boiling in glycerin, or in water, pure or with added salts, and immersion in weak or in strong alcohol. New antiseptics are constantly being introduced, but their sponsors are not always reliable authorities. Their numbers alone show either that no one trustworthy agent has yet been found, or that many are equal in their germicidal power. Unusual precautions are unnecessary for the usual procedure, but infection of eyes by instruments is to be feared in the cases of careless and uncleanly operators. Thus cataract extraction instruments are reserved for this operation alone, and are not used indiscriminately. There is, therefore, little danger that the staphlyococcus infection will be conveyed by them, and the usual methods are sufficiently reliable to prevent other forms of infection. No one of ordinary knowledge or intelligence would use for operations requiring the opening of the ball, instruments that had previously served in the treatment of purulent disease. I would not appear to deprecate most thorough antisepsis, but I would lay equal stress on those conditions which have not received the attention they deserve. I refer to infection from eye solutions, from droppers, from the breath of the operator, and from atmospheric filth emanating from bystanders or from furniture. Infection from some of these sources may be prevented by following the rules for the sterilization of all material used before, during and after operation until the wound is closed. From others, however, infection may be unavoidable. The operator must have assistants, and the preparations for operation must to a large extent be entrusted to them and to nurses. It is easy to understand how neglect or indifference may creep in without the operator's knowledge. Thus de Schweinitz reported a case of infection from one of the solutions used to cleanse the conjunctival sac following an operation for cataract extraction. The source was determined subsequently by bacteriologic examination of the solution. To reduce infection from without to the lowest possible point no attention must be neglected, or trouble saved to destroy every noxious agent not only on the hands, instruments, gauze, bandage and other surgical appliances, but also in every substance that comes in contact with the operated area. Fortunately the oculist seldom has need of general anesthetics, and thus his patent is removed from possible sources of infection in the anesthetizer and his cone and bottle, as well as from the saliva or stomach contents of the patient. The solutions—cocain, boric acid, salt, atropin, and eserin, freshly prepared—should be sterilized by steam, touched only by aseptic hands, and laid on sterile tables. The operator should wear a sterile muslin apron or coat, and must be careful to keep himself uncontaminated. Such precautions designed for the welfare of the patient, as I have outlined, cannot be carried out successfully in private houses. Therefore, in my cataract and iridectomy operations I insist on, and in other operations of any magnitude I prefer, the hospital. No modern hospital today, however remote from the centers, exists, without its operating-room fully provided with antiseptic equipment.

5. *Treatment of Infection.* Infection following extraction may assume one of two forms, an acute purulent process attacking the edges of the wound, or a chronic low grade inflammation of the uveal tract. The former appears the second or third day after operation as a grayish white infiltration invading the cornea in its entire thickness and extending ½ mm. into the tissue. This will not be mistaken for the striped keratitis not infrequently following operation, and attributed to the stroking on the corneal surface to favor expulsion of retained cortex. In this affection the interstitial layers are infilitrated by nearly parallel whitish lines radiating from the incision toward the center. They are not inclined to fuse, and they disappear in a few days without treatment. In purulent disease, the edges of the wound are seldom, even at first, united, and, if they should be, soon separate. In a few hours after the necrosis of the wound edges is noticed the anterior chamber is seen to contain, in its upper third or half, a piltz-like mass consisting of columns of bacteria. Rarely this mass may be the first evidence of infection and it may appear only after closure of the wound. Pericorneal injection is always present, but is not marked. The iris is partly hidden by the semi-opaque cornea and partly by the bacterial colonies in the anterior chamber. The pupil is small, drawn upward and partially concealed from view. The principal symptom is loss of vision. Photophobia, lacrimation and pain are slight.

In the non-purulent cases of infection the whole uveal tract, particularly the iris and ciliary body, is involved in a low grade chronic type of inflammation accompanied by the usual signs of that disease.

The prognosis of post-operative infection is most unfavorable. The treatment consists in the daily cauterization of the wound, subconjunctival injections, and the injections into the eyeball of antiseptic solutions. The remedies used in cauterization are the gavano cautery, the actual cautery, chloracetic acid and other agents, applied to the necrosed edges of the wound. Subconjunctival injections are said by some clinicians, notably Darier, to be highly useful. The introduction of iodoform rods into the anterior chamber, strongly advocated a few years ago, has not proven successful in many cases in which it has been systematically tried. The injection into the anterior or posterior chambers of solutions of the various salts of mercury has been efficacious in my hands in one case only, but in the hands of others its value has not been demonstrated. Each of us individually has so few opportunities, fortunately, to prove or disprove the value of any one remedy, that we view the appearance of infection with great anxiety, and are compelled to seek from the collated experiments of others the means of combating the disease that have received the most authoritative endorsement.

1528 Walnut Street.

PRELIMINARY NOTE ON ENUCLEATION OF EYEBALL UNDER LOCAL ANESTHESIA.*

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Since October 12, 1905, my associate and chief of clinic at the Eye, Ear, Nose and Throat Hospital has been experimenting with a method of local anesthesia in enucleation of the eyeball. We have used it with success now in twenty cases both in private and hospital practice. The mixture used, in all cases, consists of ten drops of a 4 per cent solution of cocain, ten drops of adrenalin chlorid 1-1000 and twenty drops of normal salt solution, making forty drops containing altogether 2-5 of a grain of cocain.

With a hypodermic syringe, ten drops of this mixture are injected along each rectus muscle deeply, behind the eqautor of the eye, and after a five-minute wait the operation is performed in the usual way. Our observation, so far, has been that the method is thoroughly practicable though not entirely devoid of pain.

Three cases gave no evidence of suffering throughout the entire operation. Those who complained of pain always referred it to the last stage of the operation, that of cutting the optic and ciliary nerves, the stages of dividing the conjunctiva and tendons being practically free from pain. Those who suffered most in the last stage compare the pain to that of having a tooth drawn. Generally speaking we have noticed, that robust and full-blooded men, above the average in weight, complain more of pain than the frail and delicate. This would seem to suggest the use of a larger amount of the mixture in the former cases. A few of the advantages of the method of local over general anesthesia are:

The patient is conscious, and by that fact stands warder against the awful error of removing the wrong eye. The amount of cocain used (2-5 of a grain) is almost insignificant, and certainly incomparably safer to life than any form of general anesthesia. Finally, the patients seem to prefer it, for we have, since our first case of October 12th, had no trouble in inducing all patients upon whom the operation had to be done, to select this method.

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*Read before the American Ophthalmological Society, New York, June, 1906.

A REPORT UPON THE EYES OF FOUR CLASSES OF COLLEGE FRESHMEN AT THE UNIVERSITY OF PENNSYLVANIA.

M. W. Zimmerman, M. D.,
PHILADELPHIA.

In 1897, at the suggestion of the Director of Physical Education, Dr. Casper Wister Miller, the trustees of the University of Pennsylvania appointed me ophthalmologist to that department; a position which I retained four years. Owing to totally inadequate quarters at the University, I was permitted to examine the students in my office, and had authority to send for them at convenient times. Like the other physical examinations, this was compulsory, and could be avoided only by a written excuse from the Dean, who exercised this power very rarely. These examinations were the first of the kind made at Pennsylvania. Working with the familiar fittings of a private office, and giving each patient quite as much time as other patients, the data should be reasonably trustworthy. It will indicate the deliberate character of the work if I mention that each year the examinations were begun in October, and not completed until late winter or early spring. The methods pursued were not unusual, but always included ophthalmoscopic examination, careful tests of the extraocular muscles, and for color perception by the Holmgren wools and Thomson's modification of the same.

I was under the impression that a considerable amount of this work had been done at various American colleges, and after consulting a large number of annual reports, wrote to the heads of the departments of physical examination, where an office of this character existed. Among the colleges which responded to my request for information, a compulsory examination of the eyes was reported only at Columbia, Amherst and the University of Chicago. Examinations were also made at some other colleges, but of volunteers or special groups of students only. Publications based upon the results of such work at *colleges* are very few, the most satisfactory that have come to my notice being the painstaking work of Dr. Haskett Derby at Amherst; which with Dr. Derby's work at Harvard, and Dr. B. A. Randall's study of the eyes of medcial students in Philadelphia, seem to be the most suitable for comparison with mine.

There has been of course a vast amount of work done during the past century, more particularly among the school children, and at least in the early days, principally for the detec-

tion of myopia. All the early examinatio
ones were not sufficiently thorough to giv
dence except possibly upon this one point.
mation of refraction was made, although i
test lenses and supplementary ophthalmos
were resorted to. The work of Dr. Samu
lished in 1878, remains the most valuable an
that has been made, and the bibliography att
can be referred to for investigations previous
however, deals with public school scholars.

In work of this kind the refraction can
approximately, as the use of a mydriatic is
sable. Glasses when worn assist in arrivin
believe my ophthalmoscopic estimates rarel
.5 D., but low degrees of astigmatism cannot
nized. I accept the emmetropic eye as the n
it would be better to say the ideal one, but
extremely rare. Referring to the material g
vious paper from refraction cases estimated
nearly all after the use of a competent cycl

Table No. 1 (In Percentages.)

	Emmetropia........	Hypermetropia.......	Hypermetropic Astigmatism.......	yopia.............
J. A. Spalding............. (Grammar School)	..	....	..	16
Erisman, Conrad, (Derby & Loring) (Age 18 to 19)	42	18	..	41
Erisman, Conrad, (Derby & Loring) (Age 20 to 21)	38	18	..	44
C. R. Agnew............... (Freshmen, N. Y. Amherst)	..	....	..	40
Haskett Derby (Four classes freshmen, Amherst)	45.2	20.9	..	35.
Haskett Derby, '88 & '89 (Defect in one or both eyes, Amherst)	14	44.5	..	23.
S. D. Risley (Normal School only)	12.28	66.80	..	19.
B. A. Randall (Medical Students)	12.2	61	12.2	6.
Selected group of 16,160 from various tables	20.4	60.13	..	18.

cases rejecting all lenses in the presence of a vision of 6/6 or better, were only five out of 1427, or .351 per cent. Acknowledgement must be made here that these cases were selected, inasmuch as they applied for treatment in office and hospital because of ocular symptoms. This would reasonably reduce the number of normal eyes very much, but I believe the percentage given is vastly nearer the fact than any I have seen in print.

Absolutely no dependence can be placed on most of the tables hitherto published, emmetropia being reported in various percentages from 95.3 down. It is proper to remember, however, that often "emmetropia" was understood to mean normal vision and was frequently so stated. In this connection it may be worth while to compile a condensed table giving the relative frequency with which the various optical errors are reported by others. This table is incomplete, but contains material which from the grade of the school, or the age of the students, could reasonably be compared with college freshmen. In adapting to a uniform table, rearrangement of figures was necessary.

Returning to my work at Pennsylvania, a number of more or less important facts may be presented very briefly. The first examination was made on November 4, 1897, and the last on March 14, 1901. Altogether 712 students were examined. For unknown reasons the ages of five students were not mentioned; the remaining 707 gave an average age of 17.59 years. No good purpose would be served by an attempt to group the students with regard to the course of study they were pursuing. In the total number of students 197 were wearing glasses—105 constantly. Of the glasses worn only 151 pairs had been properly prescribed by physicians, and many of these had been worn several years. The following table gives in detail the character of the glasses worn:

Table No. 2 (Glasses Worn.)

Hypermetropia	37
Hypermetropia 2D or over	4
Hypermetropic Astigmatism	32
Hypermetropic Astigmatism 2D or over	2
Compound Hypermetropic Astigmatism	55
Compound Hypermetropic Astigmatism 2D or over	19
Myopia	3
Myopia 2D or over	6
Myopic Astigmatism	4
Myopic Astigmatism 2D or over	
Compound Myopic Astigmatism	11
Compound Myopic Astigmatism 2D or over	10
Mixed Astigmatism	10
Anisometropia	4
Total	197

This leaves us 515 men in whom the op
the eyes are known only by ophthalmoscopi
excessive percentage of low hypermetropia re
reasonably true if we understood that it inclu
low hypermetropic astigmatism which canno
rated in this manner. All cases of recognized
been classed together, a very unsatisfactory
one which seemed best in view of the charac
Myopia of all degrees equals 6.8 per cent of
three cases was I satisfied that no error or
Table No. 3 gives all these facts in convenie

Table No. 3 (Ophthalmoscopic Estim

Hypermetropia ....
Hypermetropia 2 degrees or over..............
Myopia ....
Myopia 2 degrees or over......................
Astigmatism ....
Anisometropia ....
Emmetropia ....
Total ....

Congenital color blindness may be a very
hindrance in certain work, especially any occ
the reading of colored signals, also in archite
careers requiring the construction of color co
a view to discovering this defect and warning
their disadvantage, the well-known practical
fully applied to every student, and the net res
marized rather briefly as follows: There we
color blindness of the common red and gree
these being faulty for blue also. There were
men in whom perception of color was very s
uncertain. All other students possessed norm

The primary position of the extraocular mu
ed after testing by the Stevens' phorometer,
some instances by other methods, and the fa
be explained by another table which follows
cludes eight cases of strabismus:

Table No. 4. Extraocular Muscle Record (Incl
Strabismus.)

Orthophoria ....
Esophoria ....
Esophoria 2 degrees or over..................
Exophoria ....
Exophoria 2 degrees or over..................
Esophoria and Hyperphoria....................
Exophoria and Hyperphoria....................
Hyperphoria ....
Unclassified ....
Convergent Strabismus ....
Divergent Strabismus ....
Total ....

A limited number of what may best be described as "organic lesions" were noted in the course of the examination, and for the sake of completeness in this record, are given here in Table No. 5:

Table No. 5. Organic Lesions.

Marginal Blepharitis	16
Connective tissue on the optic nerve	3
Trachomatous scars of conjunctiva	1
Traumatic scars of the lid	1
Corneal scars	1
Post-synechial tags	1
Retino-chorioidal atrophy	2
Congenital coloboma of the optic nerve	1
Myopic posterior staphyloma	1
Traumatic mydriasis	1
Total	28

In 145 students, or 19 per cent of the whole number, abnormalities found were, in the judgment of the examiner, sufficient to justify the advice that his family be consulted with reference to seeking an opinion, and if necessary suitable treatment from some responsible specialist before beginning four years of study. Many of these were instances in which a low error of refraction was associated with moderate eye strain, which might not be troublesome, but it was thought wise to place the responsibility in the hands of the family adviser upon such matters. Since my resignation this work has been effectively continued by Dr. William Campbell Posey, and it is to be hoped that at some future time there will be a publication from him covering the more recent years.

In conclusion I wish to thank Dr. R. Tait McKenzie, the present Director of Physical Education, for much assistance, especially in obtaining for me numerous references to the literature of the subject.

1522 Locust Street.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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A Study of the Nativity, Sex and Age, Occupation, and Social Condition of Three Thousand Four Hundred and Thirty Six Cases of Senile Cataract Operated Upon at the Wills Hospital in Philadelphia.

OLIVER, CHARLES A., Philadelphia (*New York Medical Journal,* Nov. 10, 1906) has made an exhaustive study of 3,436 cases of senile cataract operated on in the Wills Hospital during the past thirty-five years. The results, stated as briefly as practicable, are:

1. *Nativity.* As might be expected from the generally known and historically well understood several great influxes of foreign national element (particularly the Welsh, the English, the German, the Irish, the Italian, the Austrian and the Russian in the order here given) into this part of the United States of America, nativity has exerted a marked influence upon the obtained results. To such a degree has this affected the entire question, that it has been found necessary to separate all of the cases into two great groupings, the foreign and the native born, each of which has been subdivided into country and state.

Primarily, and based upon sufficiently broad evidences in every class that has been used, it has been found that there were fifteen hundren and thirty-five foreign born cases, and nineteen hundred and one native born ones, a rough ratio of three (+) cases to four (—) cases. Of the foreign born groupings, Ireland furnished the greatest number throughout the three and a half decades; actually rising to some fifty-five per cent. This was closely followed by Germany with thirty and some per cent, England with ten per cent and Wales and Scotland with three and two per cent respectively.

Among the native born, Pennsylvania, with its preponderant sixty-five per cent, naturally gave a long lead, followed by fifteen per cent for New Jersey, ten per cent for Delaware and five per cent each for Maryland and New York. Many stray cases from the New England, the Southern and the Western States—distributed particularly throughout the third and the last half decades, are to be found; but like those of the foreign lists, they have been excluded from the tables bv reason of comparative fewness of numbers.

2. *Sex and Age.* In general, it was found that during the decades from 1871 to 1880 inclusive, the average age of operation for men was 62.2 years; during the decade from 1881 to 1890 inclusive, it had slightly increased (63.3 years); during that from 1890 to 1900 inclusive, it has again risen slightly —to 63.7 years; while during the last five years, 1901 to 1905 inclusive, it had reached the high average of sixty-six years; thus giving a rough general average of about sixtv-three years for the thirty-five years time.

Among women, the general average age, while equal to that for men (about sixty-three years), showed an increase, which, while not so great, was certain: That for the first decade being 62.5 years; that for the second decade, 63.9 years; that for the third decade, 63.5 years (a slight fall); and that for the last five years having risen to 63.8 years.

With the native born male American, there existed the highest average age for operation, and hence most probable that of maturity of his cataract. During the first decade it was 64.5 years, increasing one-tenth to 64.6 years for the second decade, and rising another tenth (64.7 years) in the third decade—until in the first half of the last decade (to date) it had arisen to the remarkable average of 67.6 years. The Irish male, commencing at 61.7 years, falling two-tenths (61.5 years) in the second decade, and rising four tenths (61.9 years) in the thrid, showed a final increase of six tenths (62.5 years) in the last half decade. The male German beginning lower at 60.6 years, gave a rise to 60.9 years in the second decade, with a sudden jump to 64 years in the third, to which he finally added eight tenths of a year, 64.8 years. The Englishman and the Scotchman at 60 years and 59 years each, rose to 63.5 years and 60 years, with a rise of the former to 65.3 years, and a fall of the latter to 58 years—to at last give the phenomenal jumps of 70 years and 71 years respectively.

Among seven hundred and thirty native born women, forming about fifty per cent of the total of fourteen hundred and fifty-two female cases in the series. it was found that the average operation age during the first decade was 63.1 years, increasing in the second decade to 65.4 years, and decreasing in the third decade to 64.3 years; ultimately rising in the last five years to 63.8 years—thus giving an increase of seven tenths of a year as the general average. The Irish female ratio increased regularly through the four decades from 60 years, to 60.8 years, to 62.1 years, and to 63.2 years as the final average, a very marked gain in the proportion. The German female, commencing with 62 years, fell to 60.8 years in the second decade, to rise to 63.9 years in the third, and to give an enormous leap to 68.5 years as the average for the last half decade; a most remarkable betterment. The English woman and the Scotchwoman, commencing at 62 years and 64 years respectively, suddenly rose to 64 years and 73 years each, to again fall very low, 62 years and 60 years each, but ultimately to reach 63.2 years as the final for the former, with a remarkable jump to 73 years as the final for the latter. All the representatives of the other nations, among whom there was sufficient material for proper averaging, showed a decided betterment in the ratios that were obtained.

3. *Occupation.* It was soon realized that as occupation among the male subject played such an important part in regard to the maturity, and even causation of the cataractous condition, it was necessary to divide the patients' vocations into four classes: (a) the unskilled laborer with his comparatively unused for near work eyes; (b) the skilled workman, whose eyes are incessantly exposed to bright glares of light and high temperatures of heat; (c) the high grade artisan, who requires accurate eyesight for proper manipulative procedures; and (d) the brain worker. whose entire time is sedentarily occupied with efforts at close vision.

The first great class, (a) composed principally of out of door laborers, such as boatmen, drivers, farmers, hostlers, miners, porters, stevedores and watchmen, although by far the greatest in number, gave the highest operative age average, sixty-six years throughout the entire three and a half decades; the average practically remaining the same.

The second class, (b) made up of blacksmiths, glass blowers, puddlers and other workers in super-heated materials, gave, by far, the lowest age for the operative procedure, fifty-eight years.

The third class, (c) composed of those in such employment as bookbinders, compositors, edge-tool makers, engravers, jewelers, shoemakers (particularly), and tailors, showed the lenticular condition fit for removal at an average age of sixty-three years.

The fourth class, (d) made up of those in vocations such as agents, clerks, and professional men, most probably, by reason of better hygiene, etc., gave a very high operative age, sixty-five years, as the average.

In regard to the women, there were but few active ones who were registered other than thousekeepers; this no doubt was owing to the fact of the limitation of means of livelihood for women which was existent at the time of the early life of the subjects in question. The average operative age for the women, without regard to nationality, was, as has been elsewhere alluded to, about sixty-three years; this time ratio being somewhat earlier among the foreign born cases.

4. *Social Conditions.* Commencing with foreign born married men as the highest at about thirty-three per cent of the nineteen hundred and eighty-four males (with a slight difference in favor of the native born—thirty-one per cent), the foreign born widowers fell to twelve per cent and the native born widowers to thirteen per cent. Of the single men, six per cent were natives and five per cent were foreigners. The women, on the contrary, gave their greatest showing of twenty-seven per cent for native born widows, and twenty-four per cent for native married women; with twenty-two per cent for foreign born widows, and nine per cent for foreign born married women. The ratio for single women, though the same in favor of the foreign born, gave the degree of per cent lower —respectively five and three.

As might be expected from the ordinary course of things, some sixty-five per cent of the male cases were married, thirty per cent had been married, and the few remaining five per cent were single. Fifty per cent of the female cases were widows, forty per cent were married, and ten per cent were single. These results, as is well known in other similar statistical work, showed a slight disproportion in favor of the married male and the widowed female. M. L. F.

The Changes in the Eye-Grounds in Otitic Diseases of the Brain, the Cerebral Membranes, and the Sinuses.

TAKABATAKE, Nagasaki, Japan (*Archives of Otology*, Oct., 1906) says that while the deductions which can be drawn from his material should not be considered final the following points can still be emphasized:

1. Changes in the optic nerves may be absent in any intracranial complication of aural and temporal zone suppurations.
2. They are more frequent in a combination of various kinds than when only one of the possible intracranial complications is present.
3. The more marked development of the eye-ground changes on one side does not prove the exclusive involvement or greater development of the original disease on the same side of the skull.

Changes in the optic nerves do not furnish aid in prognosis. The appearance or increase of the neuro-retinitis after evacuation of the pus from the cranial cavity does not of itself render the prognosis more unfavorable. M. L. F.

Artificial Cyclopegia in Errors of Refraction.

Benoit, Marie Louise (*New York Medical Journal,* Nov. 3, 1906) presents a review of the article recently published by Dr. Uribe y Troncoso in *Anales de Oftalmologie,* in which cycloplegics are classified and their use discussed. Little if anything new is brought forward, but the final paragraph of Dr. Benoit's article contains so much that is sound that we reproduce it verbatim, in spite of a certain degree of obscurity in expression.

"The results obtained with cycloplegics should not be considered sufficient for prescribing glasses because the mydriasis inherent to the cycloplegic effect may be the cause why we see corneal zones which do not take part in the vision, and may lead to erroneous results, as demonstrated by Tscherning, so that even in the normal diameter of the pupil there may exist some corneal zones of very different refractive power. If we use cycloplegics after the test with the retinoscope and the subjective examination, it is well to compare results obtained before and during the cycloplegic state. All of these data have a bearing on one another in prescribing appropriate glasses. In particularly doubtful cases, it will always be necessary to repeat the subjective examination after the cycloplegic effect has passed away, in order to be absolutely certain of the glasses we should order." M. L. F.

Epithelian Cyst Formation in the Iris, With Illustrative Cases.

Author's Abstract.

Oatman, Edward L., Brooklyn, New York (*Archives of Ophthalmolgy,* July, 1906,) says that epithelial cells proliferating in the iris usually result in cyst-formation. They seldom, if ever, possess the attributes characteristic of malignancy.

Nevertheless, a benign growth when situated in the anterior chamber may cause destruction of the eye.

Under the name of *epithelial cysts* the author includes in one group all non-congenital iris cysts in which epithelium forms a component part.

Except the pigmented cells of the pars iridica retina, the iris is a mesoblastic formation devoid of epithelium. Consequently, when an epithelial cyst develops in iris tissue, it is evident that the epithelium must have been introduced from without. The *method* of introduction is the subject discussed in the present paper.

Probably all true epithelial cysts of the iris are preceeded by the perforation of the cornea.

After the cornea has been opened by accident or design, how do the epithelial cells enter the eye? The most generally accepted explanation is that of Buhl and Rothmund, namely: in consequence of a perforating wound a fragment of surface epithelium is detached, carried into the eye, and *implanted* in the iris.

In support of this theory extensive experiments have been undertaken by Dooremaal and many others, who have demonstrated that epithelium can be implanted upon the iris. These experiments have established a widespread belief in the Buhl-Rothmund theory of cyst development.

There can be no doubt that cysts may, and occasionally do, develop in this manner, particularly those which form around cilia or contain sebaceous matter. Nevertheless the author believes the implantation method of cyst development to be very exceptional. A far more reasonable theory has been adadvanced to explain the presence of epithelial cells in the anterior chamber. In 1885, Stölting published two cases of true epithelial cysts of the iris.

From a study of these cases Stölting drew the important conclusion that the cells from which the cysts developed were not detached from the surface and implanted in the iris, but that the surface epithelium, which always proliferates and fills a corneal wound, had spread beyond the wound to the incarcerated iris. Through union of the corneal wound, the cells which had extended to the iris were cut off from the surface cells. They, however, survived, and by their subsequent proliferation formed true cysts of the iris. In other words, the epithelium had reached the iris by a process of growth and *extension* from the surface.

An uncomplicated, incised perforation of the cornea, accompanied by loss of aqueous, is shortly followed by closure of the wound and restoration of the anterior chamber. The closure is brought about by swelling and apposition of the central lamellæ of the cornea and the formation of a fibrinous exudate which plugs the wound. Although the central layers of the cornea swell, the external and internal layers retract, thereby causing both openings of the wound to gape. The wound tract is thus separated into two V-shaped clefts, one communicating with the anterior chamber, the other opening externally. Receipt of such an injury is immediately followed by active proliferation of the corneal epithelium, which spreads down into the external division of the wound, lining its sides and covering the fibrinous exudate which remains at the bottom. This proliferation of epithelium reaches its maximum in two or three hours and is usually completed by the end of the first day (Weinstein). The epithelium remains in the wound until pushed out by regenerated corneal tissue.

The presence of necrocsis or purulent inflammation does not inhibit the proliferative energy of the epithelium.

If from any cause a corneal perforation remains open and no obstacle is presented to the progress of the ingrowing epithelium, the latter will not confine itself to the anterior division of the wound, but spread beyond to contiguous parts. Such migration of cells may be followed by various unfortunate results: the interposition of epithelium between the wound surfaces may delay union or permanently prevent cicatrization. In the latter case a corneal fistula will be established. The cells may extend to the iris or, as in the following case, line the anterior chamber.

A perforating wound of the cornea was received eight years before enucleation. Some vision was retained for seven years then inflammatory glaucoma developed. At last the eye was enucleated to relieve the continued pain and inflammation. Microscopic examination showed extensive growth of epithelium in the iris and anterior chamber. The epithelial cells were deposited in superimposed layers corresponding both in appearance and arrangement to the corneal epithelium. They had lined a large portion of the posterior surface of the cornea and also formed numerous tubular and cystic cavities in the iris and between the iris and cornea. The immediate cause of glaucoma was an extension of the epithelial sheet into the angle of filteration, thus blocking the outflow of aqueous from the eye.

The course of events in this case may reasonably be stated as follows: perforation of the cornea followed by the usual proliferation of epithelium. Through some accident to the process of corneal regeneration no obstruction was presented to the ingress of epithelium, which intruded into the anterior chamber. Subsequent union of the corneal wound isolated these invading cells, which continued to proliferate until they destroyed the eye, as described above. Fuchs suggests that *"this condition may sometimes be the cause of increased tension after cataract extraction."*

Should the iris obstruct a corneal wound, the ingrowing epithelium may penetrate into its spongy tissue and form a cyst. It is impossible to state the conditions that determine extension of epithelium to an incarcerated iris. When the iris lies at the bottom of a corneal perforation, its exposed surface is covered with a layer of fibrinous lymph which protects it from contact with the epithelium. It may be assumed that should this lymph fail to form, or be lost after its formation, the iris would thereby be deprived of its natural protection against epithelial invasion.

Proliferating epithelium confined to iris tissue usually forms a cyst. This result is not wholly due to its confinement within a circumscribed space, as *non-malignant, migrant epithelium appears to possess an inherent tendency towards cyst formation.*

In the following case an unusual opportunity occurred to study this phenomenon in its early stages. The case was enucleated two weeks after iridectomy. At the site of the recent iridectomy the iris stump is incarcerated in the wound. The corneal epithelium has proliferated into the incision as usual. Here it has encountered and penetrated into the incarcerated iris, in the tissues of which it has formed a true cyst of the iris. The cyst thus created extends into the anterior chamber, its external wall resting against the posterior surface of the cornea. Serial sections demonstrated this to be a closed cavity. Fig. 7 shows a region where only superficial closure of the wound has taken place. Here the epithelium can be traced as a continuous unbroken sheet down through the track of the wound and into the cavity of the newly created cyst.

The cells lining the cyst are stratified epithelium, from five to fourteen layers in thickness. They are vigorous young cells, which stain deeply.

They tend to arrange themselves as on the cornea, the basal cells being cuboidal and the superficial flattened. Cellular segmentation exists throughout the basal layer, but is more active on the inner wall, where the epithelium is most abundant. There is no true basement membrane, the epithelium everywhere resting upon iris tissue.

The above cases demonstrate that after perforation of the cornea the surface epithelium will spread chamber unless some obstruction is presen In normal repair this accident is preven tion of the wound-surfaces and formation but when overriding flaps or other com patulous wound, epithelial invasion may it is not unreasonable to believe that in ep iris the epithelium first enters the eye *extension.* Experimental implantation of the iris proves nothing except that the ir epithelial growth. This fact counts as m sion as for the implantation theory. It als expect the survival of epithelium which h iris. The extension theory necessitates c iris and wound. That such contact does o true, as the majority of published cases de either the iris or cyst wall to the cornea.

There is no proof that normal surface has invaded the iris ever becomes maligna doubtful if primary carcinoma of the i observed. All cases reported as such hav by more than one competent pathologist. changes excited by epithelial proliferation in ber might produce a tissue closely resembli

The propensity of corneal epithelium to p accessible crevice has a very practical applic ment of corneal wounds, particularly cases It also emphasizes the well-known importan curate coaptation of flaps after operations section.

Melanosarcoma of the Chorioid anc

OATMAN, EDWARD L., BROOKLYN (*Archi ology,* July, 1906,) describes a case in whic moved for sarcoma of the chorioid. Two deposits were found. A little more than two contents of the orbit were removed becaus certain from the existence of these deposits t invaded. Microscopic examination of the tis vealed several sarcomatous deposits compos spindle cells, some of which were pigmented. pigmented, spindle cells were found in the rounding the optic nerve. The X-ray was t other day for four months. No signs of lo of metastatic deposits had appeared at the e a half.

A Case of Orbital Endothelioma.

COOPER, JAMES M., (*Archives of Ophthalmology,* July, 1906,) publishes the records of a case of endothelioma which was removed by Dr. Herman Knapp from the orbit of a man 24 years old in 1880. Since the operation the patient has had no pain, swelling or inflammation in the globe or orbit. He has presented himself at intervals of twelve or eighteen months for inspection and there has never been at any time the slightest sign of a local or a metastatic recurrence. In January, 1906, twenty-five years and nine months after the operation the conditions were described to be as follows: Globe shrunken, hard and immovable from attachments to the orbital walls. Cornea opaque. Vision nil.

Ocular Injuries From Glass and Stone.

SWEET, WILLIAM M., PHILADELPHIA, (*Ophthalmology*, July, 1906,) says that glass and stone offer so little resistance to the passage of the Roentgen rays that a general belief exists that it is impossible to demonstrate by means of radiographs the presence of either of these substances in the eyeball, but that clinical experience and experiments have proven that in many cases such bodies can be detected if they are so situated that the shadow will be cast free from that of the denser parts of the orbital bones. He reports a case in which a piece of glass was thus located and successfully removed, and another in which two small bits of stone were likewise located and removed. The results of experiments made to determine the degree of penetrability to the X-rays of different kinds of glass and stone are shown in radiographic prints. When an eye is to be examined in search of such a foreign body at least two sets of radiographs should be made with the tube at different angles to the plate in order that the rays in their passage through the eyeball will, so far as possible, shadow the various portions of the globe free from the dense orbital walls. The first set of plates should be made with the tube placed well back to the side of the head on the uninjured side, so that a shadow of the contents of the anterior segment of the globe will be shown in front of the shadow of the anterior orbital wall. In the second set, the tube is to be brought more anteriorly so that portions of the eyeball lost in the first will be shadowed in the region of the thin plate of bone at the sphenomalar juncture. The first plate of each set should be made with the tube approximating the horizontal plane of the eyeball, the second plate with the tube a short distance above or below this plane.

Thrombosis of the Cavernous Sinus Following Orbital Thrombophlebitis.

STOCKER, FRIEDRICH, LUCERNE, (*Archives of Ophthalmology,* July, 1906,) reports a very interesting case in which a woman 48 years old was struck in her left eye by a window blind while at the same time a cloud of dust was blown into her face and eyes. This occurred on January 14, 1895. A burning and redness of the conjunctiva was produced which was followed by lachrymation and inability to read with the left eye, associated with pain which increased from day to day. During the night of the third day after the accident she felt a tearing pain in her left orbit with headache and a profuse perspiration. The pain in her orbit and the headache became intolerable on the night of the fifth day and any attempt to move the left eye aggravated the headache. During the afternoon of the sixth day the temperature was 39, the pulse 94. There was a suffusion of blood at the outer canthus of the left eye which was exophthalmic, red, a little chemotic, and very sensitive to pressure. On the following day the patient was confined to bed. The outer region of the left eye was much swollen, the skin of normal color except over an ecchymosis near the outer canthus. Marked chemosis. Exophthalmos great. Cornea transparent. Movements of eyeball slight, difficult and associated with great pain. Margins of orbit sensitive to pressure, especially near the outer canthus. No fluctuation or pulsation to be felt. Media clear. The retinal veins were rather large, the papilla rather red and its margins slightly hazy. The next morning the patient was apathetic. There was a pasty odema over the entire temporal bone. The exophthalmos was extreme and the eye immovable. There was great tenderness at the site of the ecchymosis. An incision down upon the bone at the outer canthus allowed a few drops of thick pus to escape. The outer wall of the orbit was exposed to the depth of 3 cm. No bare bone could be felt. The next morning a slight amount of pus was found on the gauze drain. The right lid was slightly swollen. In the afternoon of the same day the left eyeball was less protuberant while the right had become so protuberant that the lids could not be closed over it and was immovable. The vision of the left eye had fallen to movements of the hand at 50 cm., that of the right was still ½. On the following day, January 24th, there was an extensive oedma of the left retina, the veins were somewhat dilated, and the margins of the papilla were obscure, but there was no choked disc and no hemorrhages. Vision had fallen to perception of light. The pupil was dilated and fixed. In the right eye the veins were somewhat enlarged and the papilla rather hyperaemic. The general condition was bad. The temperature was 39.5, the pulse 88. The next day the temperature fell markedly. The general condition was not much better, but the exophthalmos of both eyes had decreased. The wound also appeared much better. From this time on improvement was rapid so that on February 6th the patient was out of bed and feeling like herself. On February 28th the movements of the left eye were limited, there was some injection of the conjunctiva, the direct pupillary reflex was almost wanting, the optic disc was pale and the vessels rather small. A thin gray band of cloudiness persisted in the outer part of the retina. Central vision was lost. The vision of the right eye was 1. Three years later the margins of the left nerve were rather sharply defined with a scleral ring to its outer side. The lamina cribrosa could be seen plainly. The veins were small on the papilla, but apparently of normal size in the retina. The arteries were from 1/3 to 1/2 their normal size. In all parts of the fundus were broad white stripes which corresponded to sclerosed chorioidal vessels. Normal chorioidal vessels could be seen here and there. In places heaps of pigment could be seen. The patient died in 1899. No autopsy was allowed.

The author analyses these symptoms and concludes that a primary subcutaneous infection of traumatic origin at the outer canthus of the left eye caused inflammation of the orbital veins which extended through the orbit, produced thrombosis of the cavernous sinus which extended to the right through the circular sinus and stopped the flow of blood through the right ophthalmic vein. The prognosis of such cases is extremely bad and this is the first recorded case of recovery.

The Effects of Prolonged Lactation of the Eyes.

H. Moulton, (*Ophthalmic Record,* March, 1906,) writes of the effects of prolonged lactation upon the eyes, and to this cause attributes many cases of eye trouble among nursing women. He describes a case of retro-bulbar neuritis as one of this nature. The patient was 25 years old and had been nursing for fourteen months. She complained of sensitiveness of the eyeballs to movement and pressure with failing sight. Examination showed swollen veins, central scotoma and papillitis of the left eye. Within a week the right eye became blind. Both eyes improved rapidly until recovery was almost perfect. The essentials of treatment were weaning the baby, calomel, iron and bitter tonics. The writer also mentions a case of neuroretinitis with scotomaa of both eyes in a mother who was nursing a child more than a year old, but other symptoms pointed to diabetes as the most probable factor in this case.

O. W.

Traumatic Laceration of the Inferior Rectus Muscles.

MOULTON, H., FORT SMITH, ARK. (*Archives of Ophthalmology,* July, 1906.). A man aged 57 was struck in the face by a limb of a tree and knocked from his horse.. He consulted the writer three weeks after his accident. His recovery at this time was complete, his right eye turned upwards and uplopia, apparently as the result of a deep wound which he had sustained beneath the right eyeball, inside the lower lid. Four months after the accident the scar was bisected free from all attachments and adhesions to the globe, a single suture was employed to advance the tendon and overlying tissues after the manner of Beard in his advancement operation tenotomy of the superior rectus was then done and the eye bandaged. The final result of the operation gave the patient comfortable binocular single vision, although some proptosis still remained.

H. G. G.

Gleonia of the Retina—Reports of Four Cases.

AYRES, S. C., CINCINNATI, OHIO (*Archives of Ophthalmology,* July 1906). A microscopic examination of all four cases clearly indicated gleonia retinæ. Case No. 1 is now fourteen years of age and in good health. The age at the time of operation was two and one-half years. No. 2 is now eight years of age, and in excellent health. The operation having been performed when the child was twenty-two months old. No. 3 died about two weeks after operation and No. 4 is now two and one-half years old, and bids fair to pass the three years limit of immunity, she having been operated upon at the twentieth month. All four cases were females, which the author notes as a coincidence, as he believes the disease to be equally divided between the sexes.

H. G. G.

. A New Eye Symptom in Graves' Disease.

GIFFORD, H., OMAHA (*Ophthalmic Record,* June, 1906), calls attention to, what he considers a new eye symptom in Graves' disease, viz: *the difficulty experienced in everting the lids of some patients,* and reports three cases. In his first case, that of a woman aged 29, the eversion of the lid of the right eye caused so much strain and pressure on the tarsal conjunctiva that the latter was completely blanched in the center. The eye seemed larger than the left, looked crooked and did not close. At that time she presented no symptoms of Graves' disease, but six years later had well marked goitre while the resistance of the lid to eversion had completely disappeared.

In the second case a woman aged 42 years had Graefe's and Dalrymple's signs, with moderate goitre. Her upper lids could be everted only partially and with great difficulty, the center edge of the tarsus was bent back out of sight, and the blood pressed out of the tarsal plate and conjunctiva.

In the third case, a woman aged 27, Jellinek's and Rosin's signs were present. Graefe's sign was slightly marked, and there was puffiness of the lids with excessive lachrymation. It was impossible to evert the lids in the usual way. The best way was to push down the upper edge of the tarsal plate with a probe, and the eversion thus obtained was maintained with difficulty. It is Dr. Gifford's opinion that this lid resistance is due to an unnatural irritability of one or both levators of the upper lid and that the affected muscle is the non-striated levator of Müller.

In conclusion he claims that one of the earliest symptoms in certain cases of Graves' disease is *marked involuntary resistance to eversion of the upper lids.*

He also calls attention to another symptom—hypertrophy of the tissues between the eyebrows and the eyelids, with slight redness of the skin. O. W.

Posterior Sclerotomy as a Preliminary to Iridectomy in Acute Glaucoma.

KNAPP, ARNOLD (*Archives of Ophthalmology,* July, 1906). The author believes that the cases which require this preliminary operation are cases of primary acute glaucoma or chronic glaucoma during an inflammatory attack where the eye is very hard and the anterior chamber so shallow as not to permit a satisfactory incision. The operation consists in puncturing the elleia with a cataract knife a little above or below the horizontal meridian, the eye turned well inward, by rotating the knife vitreous escapes. The ordinary iridectomy then follows. The writer reports some cases the operation apparently aggravated, the condition is only one of this number, in this one, however, when an intraocular hemorrhage occurred, he believes the fatality would have followed the usual operation as the eye was degenerated. H. G. G.

Some Observations on Worth's Methode of Treatment of Convergent Squint in Young Children.

EMERSON, LINN, ORANGE, N. J., (*Ophthalmology,* July, 1906,) holds that the "one true and prime cause" of both heterophoria and strabismus is a deficiency or absence of the fusion sense. As predisposing causes he enumerates: 1, Hyperopia and hyperopic astigmatism. 2, Anisometropia. 3, Specific fevers, especially whooping cough, measels and diphtheria. 4, Violent mental disturbances (fright fits). 5, Injury during birth. 6, Heredity. 7, Congenital defects. The plan of treatment followed is: 1, Optical correction. 2, Occlusion of the fixing eye. 3, The use of atropine in the fixing eye. 4, Training of the fusion sense. 5, Operation. He gives full correction under atropine in all cases. The use of the occlusion pad over the fixing eye is enforced when possible, but as it is not tolerated in many cases he has grown to depnd more on the use of atropine to blur the vision of the fixing eye. For the training of the fusion faculty he employes the Worth-Black amblyoscope supplemented by the stereoscope with Kroll's pictures. When operation is necessary he prefers the advancement of Dr. Wootton as modified by Dr. J. J. Thomson.

A Secure, Looped, Single-Stitched Advancement Suture, With a Consideration of Scleral Anchorage.

STEVENSON, MARK D., AKRON, O., (*Ophthalmology,* July, 1906), uses an iron-dyed, black, braided silk suture, about No. 8 in size and a third of a meter long which is threaded with two needles, one near each end. The thread is boiled just before operation and with sterile fingers is drawn across a small piece of sterile gauze on which some sterile 2% iodol ointment has been placed. After the first part of the operation has been completed he grasps with forceps the conjunctiva, capsule of tendon and muscle, passes one of the needles from without inward through the conjunctiva, capsule and junction of the middle and lower thirds of the tendon or muscle. He then passes the same needle outward through the lower margin of the tendon or muscle, the capsule and conjunctiva and then back through all three just behind the first point of entrance, thus forming a loop inclosing the lower third of the muscle or tendon and some of the capsule and conjunctiva. Next, after freeing the conjunctiva from the sclera to within 4 or 5 mm. from the cornea, the needle is carried under the conjunctiva almost to the edge of the cornea and stitched deeply through the episcleral tissue into the sclera a little below the horizontal meridian. The needle on the other end of the suture is likewise used to make a loop on the upper third of the tendon, inclosing some capsule and conjunctiva, and to make an episcleral and scleral anchorage near the cornea, usually close to the other suture, and then the two ends are tied.

A Successful Operation for Conical Cornea.

STAUFFER, F., Washington, (*Opthalmic Record,* May, 1906) gives an interesting account of a successful operation for conical cornea of the right eye. The patient, a young woman, had experienced no inconvenience, it was the unnatural appearance of the eye that attracted her attention. The disease was then too far advanced to be affected by treatment. Two years later a small ulcer formed on the apex of the cone on the right eye, which spread and deepened until it threatened the loss of the organ. The operation was then decided on. After the eye had been prepared in the usual manner, a small curved needle armed with a fine black silk ligature was passed through the cornea into the aqueous chamber three mm. below and two mm. to the nasal side of the center of the cornea and brought out above at a corresponding point. A second suture was passed through the cornea in the same manner on the temporal side. An elliptical piece three mm. broad and six mm. long was then excised from the whole thickness of the cornea between the sutures. The first incision was made with a Grafe knife by transfixing the cornea at the point where the temporal angle of the eclipse was desired and carrying the knife through the aqueous chamber, making the counter-puncture at the point desired for the inner angle of the ellipse, and then cutting downward and forward. The desired amount of corneal tissue was then removed with a small curved scissors. When the excision was completed the sutures were tied and the wound closed. Twelve days after the operation the margins of the wound were firmly united. The patient is now able to sew and read, without the use of glasses.

O. W.

Antipyrine Keratitis.

INOUYE, PROF. MITSIYASU, Tokio, Japan, (*Ophthalmology*, July, 1906) described a case of this nature which he observed in a women 48 years of age. On Nov. 9, 1905, she took 0.8 gram of antipyrine at 10 a. m. and 1 gram more at 3 p. m., at 8 p. m. both eyes became painful and swollen; at 10 o'clock the swelling and pain were at their height and she passed the entire night without sleep. The intensity had subsided somewhat by the next evening. When seen by the author on Nov. 11th nearly the entire face was red and swollen. The swelling was most pronounced in the upper eyelids, particularly on the right side. The conjunctiva was not hyperæmic. Many small infiltrations, to the number of 25 in the right and 16 in the left, were observed in the cornea close to the the limbus. In one spot two of the neighboring infiltrations had coalesced into a larger one. Some of the outer portion of each cornea was free from infiltration. On oblique illumination and magnification with the loupe many additional little infiltrations could be seen in the superficial layers of the cornea. The papillæ seemed to be swollen. The keratoscope showed the corneal images to be irregular. Vision was reduced to counting fingers at 1 meter with the right eye, at 1.5 meters with the left. The treatment instituted was instillations of a 2% dionin solution daily for three days, supplemented by boric compresses. On Nov. 13th the infi part of the right eye was not apparent to c good light, and the small spots could n eye. The corneal picture soon became e

Monocular Visible Spasm of the Central

HARBRIDGE, D. F., Philadelphia, (*O* 1906) observed the following phenomen a man 49 years of age. The pupil dila inferior temporal artery gradually becam until it collapsed. This was rapidly fo change in the inferior nasal and superior the veins, beginning with the inferior. T became pallid, more marked around the p at the upper and lower borders, and the c be distinctly seen overlying the nerve. The what hazy. After about four minutes the gan to fill gradually, the others followed veins, the inferior first, which became e Sight did not return synchronously wit vessels, but followed immediately after, still dilated. Hippus was noted after the

The Effects of "Full" and of "Minimum" D phate and of Homatropine Hyd

HOWE, LUCIEN, Buffalo, (*Ophthalmolo* a study of the effects produced by diffe drugs concludes:

1. To determine the refraction as ac at a single visit, it is best to use atrop 0.00026 gram (a disc of 1-500 or 1-250 gr

2. To learn the condition of the accom use atropine about 0.000005 to 0.0001 gra grain) or a corresponding part of it.

3. When we are satisfied to know, per the condition of the refraction without reg dation, about 0,0013 gram (1-50 grain) o far the most convenient.

4. As a mydriatic, homatropine is infi the two. For that purpose a disc of 0.0001 is usually sufficient.

A Case of Hypertrophia.

COLBURN, J. E., (*Ophthalmic Record*, J the following case of hypertropia. The p 33, had been treated for various nervous unsuccessful attempts had been made to ad rior rectus, and the patient consented to an tion the conjunctiva over the inferior rec was opened, the muscle exposed and detached. A band of unusual thickness was found to limit the traction made on the muscle, and was severed. On the ocular side of the muscle an adventitious head was severed which had two-thirds of the thickness and the breadth of the main head. The eye had a hyperphoria of 5 degrees. Eight weeks later there was practical orthophoria, full range of motion, with perfect ocular and general comfort.

It is the opinion of the author that an adventitious band of unusual distribution, weight and rigidity, was the cause of the trouble and that the superior muscle should have been advanced *only after the tendon of the inferior rectus had been freed.*

O. W.

Eye Infection. Third Hundred Cases with Bacteriological Examination.

Smith, Dorland, Bridgeport, Conn. (*Archives of Ophthalmology,* July, 1906).—The writer reviews the general technique in the preparation of bacteriological specimens for examination, and especially urges cultivation whenever practicable. He gives a detailed description of many interesting cases, with their treatment, and summarizes as follows: Of 70 cases of conjunctivitis, staphylococci, the Kochs-Weeks bacillus, and the diplobacillus of Morax-Axenfeld were found in 34—practically one-half the cases. The xerosis was found in 8, no organisms in 12, four doubtful, and other germs in 12. In nine cases of corneal infection, streptococci were found three times, staphylococcus, pyocyaneus bacillus, and mould once each, and three indefinite. The pneumococcus and the streptococcus are again the prominent germs in the lachrymal cases; in nine cases the former was found three times, the latter four, three of these in lachrymal abscesses. In infections of the lid the staphylococcus aureses largely predominated. In 16 cases no organisms could be found to account for the infection, and in six the bacterial record is unsatisfactory. In mixed infections, where two or more organisms were found in considerable number, these are mentioned in the description of the case: Organisms so few as to be presumably adventitious are not mentioned. Of the associated organisms, the xerosis was found once each with the pneumococcus, the gonococcus, the Kochs-Weeks bacillus, and the diplobacillus, twice with the streptococcus, and four times with the staphylococcus. Organisms of the subtilis group occurred four times, but in no case as the probable cause of infection; once each with the streptococcus and the diplobacillus, and twice with the staphylococcus.

The staphylococcus and streptococcus occurred but once together. Unidentified bacilli were found with the streptococcus twice, with the staphylococcus three times, and with the diplobacillus once. Altogether the xerosis group occurred nineteen times, nine of these alone. It is an open question what part, if any, they play in such cases. Nearly half of the cases were from the clinic at the Manhattan. The most notable differences between these and the Bridgeport cases were in the 12 Kochs-Weeks infections; only one of these occurred in Bridgeport. This very strikingly confirms our former observation that, while Kochs-Weeks conjunctivitis is comparatively common in New York, it is quite rare in Bridgeport, only 56 miles away. H. G. G.

On Pigmentation of the Retina of the Optico Ciliary Neurectomy in Man.

STUDER, THEODORE F., Berne, Switzerland (*Archives of Ophthalmology,* July, 1906)—An anatomical examination of an eye enucleated for repeated attacks of glaucoma revealed a leucocytic exudate in the conjunctiva, an increase in the corneal corpuscles, an infiltration of the anterior chamber by red blood corpuscles, a round cell infiltrate in the sclera, and an atrophy and round cell infiltration of the ciliary bodies and iris. The retina and chorioid were atrophied. There was a dimunition in the number of rod and cone cells, and the ganglion cells were replaced by the hypertrophied supporting tissue. There were a few small areas in which the retina was thinned and its layers unrecognizable. The marked features of these areas was the presence of proliferated pigment epithelium extending through the entire thickness of the retina. The characteristic structure of the retina was lost, and it was composed almost entirely of an almost homogeneous connective tissue with some fibres running in the plane of the retina. In this tissue were many cavities and scattered round and ellipsoid nuclei. Leucocytes were not present. The striking feature is the intense pigmentation of the entire temporal portion of the retina. The author is of the opinion that these cells are enlarged phagocytic pigment epithelial cells which have absorbed degenerated cells of their own kind. The presence of well stemming nuclei in the cells from in the retina would seem to indicate that they had migrated actively from their original position. H. G. G.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITIAN AND THE ENGLISH COLONIES.)

BY

WALTER R. PARKER, M. D.,
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Chorioidal Hemorrhage Following Cataract Extraction.

McNABB-H. HORSMAN (*Ophthalmic Review*, November, 1906) says: "The first to describe this condition seems to have been Wenzel, in 1779. From reported cases we learn 'that the hemorrhage may occur immediately after the corneal section, later before the dressings are applied, some few hours or a day or more after operation.' The method of extraction seems to have no influence, though DuGama, Pinto and Girand obtained favorable results by performing a preliminary iridectomy.

At the Manchester Royal Hospital, three chorioidal hemorrhages occurred out of a total of 4,422 extractions. In one tension below normal, hemorrhage occurring the night after, and in the other three days after the operation. The reported case was aged 66. Right eye aphakia. Left eye mature cataract. Simple extraction attempted. Fluid vitreous escaped after iridectomy, and lens spooned out. Two hours later the dressings and bandage soaked with blood and on removing the dressing, blood clot between lids. A fortnight later, eye enulceated. The globe was filled with blood and microscopic examination showed chorioid disorganized by hemorrhage."

The author states the most frequent cause is probably atheromatous or fatty disease of the vessels. In cases where there is increased tension, or in the decrepit or when there are marked general vascular changes evident, it seems advisable to perform a preliminary iridectomy. Little can be done after hemorrhage has occurred.

Specific Hyalitis.

STEPHENS (*Lancet*, August, 1906), in a paper on "A Form of Amblyopia in Young Children Consequent Upon Inherited Syphilis," gives the brief histories of several cases of specific hyalitis, a secondary manifestation of congenital syphilis. In these infantile amblyopias, the hyalitis forms the leading ophthalmoscopic feature of the case, while the underlying chorioiditic or retinitic lesions may be relatively insignificacnt.

In Stephenson's opinion, a cloudy vitreous means one thing alone—the existence of congenital syphilis.

The diagnosis of vitreous opacities may be simple or difficult. Actual "floatus" are seldom seen. ally dust-like and veil or conceal the func

In some cases, the hazy vitreous clears ence of mercury. The fundus may then a striking nature. The particular seque sent a primary syphilitic retinitis.

The Old and the New in Ocular T

Ramsay, A. Maitland, M. D., Glasgow thinks that the great contrast between th ophthalmic therapy lies in the fact that th great point of general treatment, while th surgeon tends too much to look upon o mainly local and operative. This tenden cause treatment ought to deal not only w with the general condition. The advanc crease of knowledge have thrown an enti treatment of eye diseases.

This is especially true of

(1) Refraction.

(2) Mydriatics—Atropine has long oc in ocular theraputics. To meet the dema the effects of which will pass off quickl drin and euphthalmine have been supplie

(3) Antiseptics. Long before anything teriology, the three favorite drugs used inflammation of the conjuctiva, were nitra of zinc and per chloride of mercury. Bact merely substantiated the results of clinica ing their value.

Since the nitrate of silver had several chemist has produced three valuable silv collargol, and argyrol. Ramsey uses 10 chronic inflammation of the conjunctiva, 1 cent wounds of the eye lids and argyrol conjuctiva. In infected ulcers of the co chenosol, 1-4000. In surpiginous ulcer, t cautery is a great triumph for modern oph

In chorioiditis, for example, accompanyi in detachment of the retina, Ramsey has ing results from subconjunctival injectio ployed is 8% chloride of sodium in a 1 to cyanide of mercury; 15 to 20 minims be time.

Metastatic Affections of the

Mr. W. T. Holmes Spicer (*The Lancet,*

showed three illustrative cases, before the Ophthalmological Society. The first, a young man who had a sudden attack of pain in one eye and obliteration of central part of field of vision. Was well except for a large crop of boils. Three days after attack, examination of eye showed a brilliant green mass springing from center of optic nerve, well defined, no appearance of structure. Its appearance suggested parasitic cyst. It was lacerated with a needle, but it only contained some curdy opaque material like pus. The eye was enucleated. The swelling was found to be an abcess in the substance of the retina, having at its center a large mass of staphylococcu. Recovery rapid. The second case, young man with large boil on neck was suddenly seized with pain in eye and loss of sight. Ophthalmoscopically, he had retinal phlebitis well marked in one eye and slightly in the other. After prolonged treatment, one eye got well and the other became quiet. Later, enucleation. The third case also one of a young man who had retinal phlebitis followed by local keratitis, profunda after a serious attack of ptomaine poisoning. The fourth case one of a diffuse exudation on the surface of the chorioid invading slowly, nearly the whole of it and producing in places, detachment of the retina. The patient was a young man suffering from a large crop of boils on the neck. Treatment by antistaphylococci injections was commenced but patient refused to continue it. The final result is not given. W. R. P.

An Improved Electro-Magnet for Use in Eye Surgery.

PARKER, FRANK C. (*Ophthalmoscope,* August, 1906), after drawing attention to the deficiencies of the present-day magnets, such as lack of personal control, absence of magnetism indicators, awkward postures necessary in operating, screw tips necessitating a longer time in changing, rounded ends on tips, etc., presents an improved form of hand magnet in which these drawbacks have been improved upon materially. The advantages may be summarized as follows:

1. The operator has strictly personal control by means of a button on the end of the magnet, easy of access.

2. An indicator attached to the core keeps the operator constantly advised as to whether or not his magnet is working.

3. Upon release of slight thumb pressure, the current is automatically shut off instantly. The author considers this of great importance, as it saves shifting of the foreign body after x-ray localization has been made.

4. The tips are attached by means of a lock. This requires only a slight turn of a few millimeters as against the

screwing-in process employed at present in the majority of magnets.

5. The end of each tip is cup-shaped, allowing the foreign body to be pushed into the receptacle by the closing of the scleral walls, thereby giving protection and lessening the dangers of being pinched off during withdrawal. This is a radical departure from the usual tips having rounded ends.

6. Beveled core. The core is shaped so that the magnet can be held in almost a horizontal position instead of a vertical.

7. The lifting power is over eighty pounds — about ten times its own weight.

8. The dimensions are: Length, 8 inches, with 1½ inches of core projecting; diameter, 3 inches; diameter of core, 1½ inches.

9. The weight is 8¼ pounds.

10. Connecting wires are attached to a removable plug.

11. The exterior is silver-plated with gun-metal finish.

(The writer has seen this magnet used frequently at the Wills Eye Hospital, where the advantages claimed have been readily demonstrated.) H. G. G.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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Tuberculosis of the Chorioid.

CARPENTER, G. (*Die Ophthalmologische Klinik,* Aug. 25, 1906.) Tuberculosis may attack every part of the eye except the lens, and in the pathology of the chorioid plays an important role. Carpenter has examined eighty cases of chorioidal tuberculosis, among which forty-nine were acute, eleven chronic, and twenty showed cicatricial changes.

Acute Military Tuberculosis. The tubercles are situated mostly near the papilla and macular region, and sometimes in the center of the macula; they are seldom found in the periphery. One eye only is affected as a rule; frequently a single tubercle is found,.but most often two or three. The greatest number observed by Carpenter was twenty in a three-year-old child; each eye contained ten. They are round or oval or sometimes kidney-shaped, but are rarely of irregular form. In color they are yellowish or grayish white. They are surrounded by a zone of pigmentation, giving the appearance of an intensified pigmentation of the retinal epithelial cells. As a fact, distinct changes are found microscopically in the retinal epithelium. The surface of the chorioidal tubercle is free from pigment, and the appearance is as though the normal pigment had been absorbed. The chorioidal vessels, in so far as they are visible, disappear suddenly as the new formation is reached. In one case the tubercle was surrounded by a pale red ring, that was either caused by a local congestion of the chorioidal vessels or by a hemorrhage. The retinal vessels pass undisturbed over the tubercle. The tubercles vary in size from the diameter of the large retinal vessel to many

times the diameter of the disk. In
measured eight disk diameters. The
ring was never seen by Carpenter to l
is so often observed in old syphilitic l

Chorioidal tubercles are found in ca
culosis, and in tubercular meningitis, as
of both forms. In the majority of cas
intracranial disturbance was present; tv
six cases had meningitis.

Among atypical forms in miliary tub
a case in a child two and a half years
dirty-gray tubercular mass 8 d. d. si
tubercles in a boy fourteen months ol
and having numerous pigment spots up
sixteen out of forty-seven cases there
unilateral and in some cases limited to a

Chronic Tuberculosis of the Internal
Surgical Tuberculosis. Tubercle of the c
sis pulmonalis, and tuberculosis of the g
tuberculosis, etc. Examination of nin
tuberculosis in children, ranging in age
sixteen years, showed twelve cases, 9.24
chorioid. In three cases, the diagnosi
topsy. The chorioidal lesions in these ca
those in the acute cases.

Cicatricial Lesions in Chorioidal Tub
sence of pathological examination it is in
certainty that these lesions are the resul
not perhaps caused by syphilis. Carpent
of cases, however, which would seem t
clinical evidences.

The principal distinctive features of
tuberculosis are:

1. Central location.

2. The size of the lesions and their
only.

3 A central atrophic spot surround
frequently a zone of pathologically chang

4. Sometimes in the immediate neig
ber of quite small atrophic spots.

Pathological Anatomy. The pathologic
oidal tuberculosis is essentially the same a
in general. In typical cases the chorioid
filtrated with small round cells, among
greater or less number Langerhan's gi

cells are absent; caseation is pronounced. Examination for the tubercle bacillus is often negative, due, Carpenter thinks, to the use of formalin in preparation.

W. T. S.

Inoculations of Syphilitic Virus into Rabbits' Eyes.

SCHULZE. (*Klinische Monatsblätter für Augenheilkunde*, Sept., 1905.) The successful inoculation of animals with syphilitic virus has brought the etiology of syphilis within close range for further investigation. The syphilis thus engendered in the anthrapoid and macacus apes closely resembles the human variety, typical primary and secondary lesions having been observed (Finger). In horses and pigs a syphilitic roseola was demonstrable. Still, animal syphilis in general runs an atypical course, Schulze in this connection alluding to the inoculation of smallpox virus into white mice and rabbits, the resulting infection likewise characterizing itself by atypical manifestations.

To exclude exanthematous eruptions which might arise from the introduction of extraneous albuminoid substances, the successful inoculation of an animal of the same species is required with virus obtained from the first inoculation.

In variola, foot and mouth disease, scarlet fever and syphilis, diseases more or less related, Siegal was able to show that the parasitic organisms concerned in those affections belonged to the flagellatæ group of protozoa. Because of their almost infinitely small size they have eluded careful observation for many years, and even now it is impossible to differentiate these diseases alone by the appearance of the protozoa. However, in variola and scarlet fever, the micro-organisms are situated in the plasma, in foot and mouth disease in the nuclei of the epithelial cells. In syphilis their position is either within the plasma of the connective tissue cells or in the connective tissue substance.

To these bodies Guarnieri and Siegel applied the term cytorrhyctes variolæ, scarlatinæ, aphtharum and lues. Recently it has been supposed that these bodies are not living organisms, but nuclear detritus, etc. Their inherent rotary and projectile properties, however, make such assertions hardly tenable. Flagellæ are often demonstrable in slowly moving cytorrhyctes. The addition of chloral prohibits notility. The living cytorrhyctes measure ½-2½ microns. Stained sections fixed in absolute alcohol reveal the presence of well-defined nuclei arranged in groups of 2, 4, 8, and 16. The flagellæ are stained by Gilinsa's method. Schulze then outlines in detail the technique

of staining with Azure II. In perpar
method the nuclei of the cytorrhyctes ta
er blue than the nuclei of the tissue st
ranged in pairs and surrounded by a fa

Living cytorrhyctes can be procured
internal organs from ten to twenty d
Schulze at Siegel's suggestion continu
inoculations along ophthalmological line

Hänsell, Piorkowski, Thibierge and
shown that the disease was communicab
bits and monkeys, although at one tim
anterior chamber of rabbits was consid
ferentiating syphilis from tuberculosis, t
inflammatory reaction favoring a diagn

To render infection certain, Schulze
terior chamber from above, incises the
the virus directly to the iris wound. T
inoculated in this manner. In three, in
ous inoculation was performed. The ey
key were similarly inoculated. A cont
glycerine and distilled water was made
bit. The virus consisted of (a) finely
initial lesions; (b) blood from a syphilit
(c) fresh kidney emulsion obtained fro
lated rabbit. One-half he inoculated wit
of preserved virus, three immediately af
after two days, four after six days, two
one after forty days. Subcutaneous co
monkeys with this same virus were also

The clinical and pathological results a
lar form, the histological findings in si
cluded.

The control animal inoculated with g
eventful recovery. In the other rabbits
evolved themselves in the following ma
two days, the primary wound reaction h
tion particularly at the site of inoculatio
nea is hazy and the aqueous humor so
iris was contracted and hyperemic. Wit
iris nodules at the site of inoculation
ten to fourteen days the inflammatory pro
Neither hypopyon or synechiæ complicat
nodules eventually attain the size of a
four weeks). As the eye becomes quiet
assume a grayish color and gradually de

gades, cutaneous ulcerations and alopecia were observed, but such evidences of a generalized infection are much more apparent in monkeys. Many of the rabbits succumbed to the disease during the first few weeks.

The microscopical findings (iris) suggest a chronic process affecting particularly the vascular system. The cytorrhyctes are found in the edematous circum-vascular spaces and not infrequently within the vascular coats near the intima. They are never found in the nuclei. Schulze was unable to prove the presence of cytorrhyctes in the irides of healthy rabbits.

The infection rapidly becomes general, few cytorrhyctes being discovered in the iris tissue fourteen days following inoculation, whereas numerous cytorrhyctes were found in the internal organs. The inoculation of monkeys with virus procured from the irides, or with renal emulsion, was invariably followed by primary and secondary syphilitic manifestations, and the examination of the internal organs postmortem revealed many cytorrhyctes.

Schulze and Siegel have observed occasional spirochæta in ulcerated initial lesions, but they have never encountered any in the blood of a syphilitic or in the blood or internal organs of inoculated animals. A. C. S.

The Therapeutics of Guaiacol in Ophthalmology.

Ferson. (*Die Ophthalmologische Klinik.*, Jan. 30, 1906.) The author prefers the synthetic crystalline preparation of guaiacol to the impure liquid product obtained from creosote. He discusses the following methods of administration and their indication:

I. (a) *Local Applications* (skin). Concentrated solutions possess analgesic and antipyretic properties, but should not be applied in doses exceeding 1-1½ grains.

The disagreeable odor of guaiacol is not so marked in 10% oily or glycerine solutions or in solutions containing camphor or menthol. All these can be used advantageously in herpes zoster. The glycerine solution acts particularly well in softening the crusts, and besides is easily removable with warm water. The addition of dionin, cocaine, aconitine, quinine, etc., often becomes necessary in this disease.

Solutions of guaiacol combined if need be with other medicaments are also useful in facial neuralgias, dacryoadenitis, phelgmonous dacryocystitis, furuncle, etc.

(b) *Conjunctival Applications.* The combination of a glycerine solution of guaiacol with copper sulphate not only renders the application less painful, but introduces an alterative element.

Solutions of guaiacol in sterile oil 1-50 are of use in the treatment of burns of the cornea and conjunctiva. Oily solutions of the pure alkaloids in conjunction with guaiacol are particularly indicated in tuberculosis of the conjunctiva.

II. *Inhalations and Nasal Applications.* Oily solutions and ointments of guaiacol, camphor, and menthol are applicable in nasal affections accompanying infectious conjunctivitis, keratitis and dacryocystitis.

Inhalations of menthol, guaiacol, camphor, etc., are less dangerous and better borne.

III. *Administered by the Mouth.* As a substitute for creosote in ocular affections dependent upon tuberculosis, scrofula and syphilis, guaiacol meets all indications. The drug should be prescribed in pill, capsule or codliver oil with or without eucalyptol, iodine or iodoform.

IV. *Subcutaneous Injections.* Should the internal administration of guaiacol cause gastric distress, intramuscular injections of guaiacol may be resorted to. The addition of guaiacol to an oily solution of mercuric binioide (1-30) renders the injection almost painless.

The guaiacol preparations are more soluble in water, but their anesthetic properties are much inferior to those of guaiacol, cocaine and stovaine. A. C. S.

Extirpation of the Lacrimal Sac.

Jocqs. (*Die Ophthalmologische Klinik,* Feb. 15, 1906.) This radical method of treatment according to Jocqs is only indicated in simple dilations of the sac without perforation. In those chronic forms of dacryocystitis, peridacryocystitis and perforation usually of the anterior wall, a thorough curettement is only to be considerend.

The difficulties encountered in the complete extirpation of the lacrimal sac have discouraged many operators and unfortunately as yet the operation has few supporters.

To facilitate the operation, injections of paraffin, etc., into the sac have been resorted to. Though sharply differentiating the sac from the surrounding structures, these injections so harden the sac that manipulation is rendered difficult, ofttimes leading to rupture of the sac and escape of its contents.

Jocqs after incising the sac vertically and sponging the cavity dry introduces a small moistened pledget of cotton just large enough to permit of approximation of the cut edges, which are then caught in the grasp of a small hemostatic forceps. By this means the sac is easily handled and gradually dissected from the adjacent parts. Having removed the sac the author proceeds to sounding of the nasal canal, thus striving to retain a natural channel for drainage. He does not favor the Fromaget method, which has for its object the obliteration of the duct.

The wound is sutured and a compress consisting of superposed layers of cotton of graduated sizes is applied. The stitches are removed at the end of five or six days, a light pressure bandage then being worn for several days more.

If the extirpation has been complete, speedy wound closure follows. Jocqs seldom uses a general anesthetic, relying mostly upon superficial and deep injections of cocaine, stovaine (cocaine 1%, stovaine 2%).

The troublesome lacrimation at times induced by removal of the sac may necessitate an excision of the lacrimal gland.

A. C. S.

Pigment Naevus of the Chorioid.

SEGALOWITZ. (*Dic Ophthalmologoische Klinik*, May 10, 1906.) Segalowitz reports this congenital anomaly of the chorioid the first case recorded, occurring in a girl eleven years of age. Vision in both eyes was 5/120. There was mixed astigmatism in the right eye, compound myopic astigmatism in the left; correction of the former raised the vision to 5/12, the latter to 5/4.

Ophthalmoscopical examination of the right eye disclosed a kidney shaped pigment mass 3½ disk diameters in length about 4 disk diameters out from the macula between two branches of the superior temporal vein and crossed by the superior temporal artery. Closely hugging its temporal border was a smaller crescent shaped band of pigment. Smaller islands of pigment, twenty-four in all, were scattered along the branches of the superior temporal artery and vein just above the macula. Inasmuch as the vessels coursed over these masses, Segalowitz concluded that they lie within the chorioid. No inflammatory, atrophic or vascular changes were noted.

Other naevi were discovered on the neck, breast and hip.

With the astigmatic correction vision gradually reached the normal. The fundus condition, however, remained unchanged.

A. C. S.

Conjunctival Incrustations Following the Use of Hydrogen Peroxide.

NEUSTATTER. (*Die Ophthalmologische Klinik*, Jan. 30, 1906.) After applying hydrogen peroxide to the conjunctiva and then exposing the tarsal conjuncti Neustatter has occasionally observed y circumscribed patches simulating infa glands. Within an hour, usually no tr were visible. Rarely the entire conj There were no apparent lesions of the e have favored a direct action of the c conjunctival location and dissemination against an escharotic state of the conj

Neustatter thinks the production of h between the various tissue layers a poss the drug should single out definite lo composed of similar elements, he is at refers the question to more experienc

Alypin in Office Wo

KIRCHNER. (*Die Ophthalmologische I* Kirchner uses a 4% solution. Its adva general are its less poisonous properti with the size of the pupil or with accomm ness. Moreover its anesthetic action is after instillation) and complete that Kir valuable local anesthetic during busy o stillations of alypin as originally manuf erable burning, the new preparations a tating than cocaine.

Solutions should always be freshly this demand tablets of alypin are now author especially recommends for office cocaine only for diagnostic purposes an tive procedures. The vaso-dilator actio disposes to hemorrhage, whereas the ence of cocaine makes it probably the saf tions.

A Case of Bilateral Abducens Paralysis A Associated With Excrutiating Cephalalgi vical Region.

LANDOW. (*Münchener Medizinische* 24, 1906.) Four cases of eye muscle pa al anesthesia have been published. Land paralysis being the first case of bilater tion occurred in a man fifty-three yea operated upon for some rectal affection. injection of scopolamine-morphine, a 5 kainssuprarenin was injected into the spinal canal, anesthesia still being incomplete it was found necessary to administer chloroform, the patient, a very nervous individual, offering strenuous resistance during early anesthetization.

One week later the patient exhibited all the symptoms of a double-sided sixth nerve paralysis. In addition he commenced to suffer almost unbearable pain, starting in the supraorbital regions and traveling over the temples to the neck and shoulders. The symptoms were partly relieved by pyramidon and the recumbent posture. At the end of three weeks, the pains had mostly disappeared. The paralytic manifestations improved more slowly, a complete restoration of function, however, being predicted by the author.

According to Adam, a hemorrhage in the region of the nucleii of the affected nerves is held responsible for the paralysis. Landow is in accord with the view expressed by Loeser, that the injected anesthetic acts as a poison, an upward course within the dural sheath being favored by struggling efforts of the patient. The intense pain characterizing the case, Landow attributes to meningeal irritation.

Landow is opposed to the indiscriminate use of spinal anesthetics. In nervous patients especially this method of anesthesia in general is contraindicated. A. C. S.

The Doctrine of Immunity in Ophthalmology.

Reis. (*Wiener klinische Wochenschrift,* July 19, 1906.) In a lengthy article Reis discusses the possibilities of toxins, antitoxins and allied products in relation to the etiology and treatment of various important ocular affections, his views for the most part being founded on Roemer's valuable investigations. Before taking up the subject in detail, he refers to the privileged position the eye holds in the science of immunity. Heretofore, because of the poisonous properties of the toxins, few experiments could be carried on in the human individual. In abrin, the toxin contained in jequirity, however we possess a toxin, closely resembling a bacterial toxin which can be employed without endangering the life of the individual.

Experimental instillations of abrin and antiabrin into the conjunctival sac confirms Ehrlich's views that the toxin forms a chemical union with the antitoxin without the participation of the human organism. Furthermore, a sterile, neutralized mixture of diphtheritic toxin and antitoxin injected into the vitreous of animals will result in only a retinal hyperemia, conclusive evidence that the union of toxin with antitoxin must have been complete; had there been but a slight excess of toxin, the effects upon the retina would have proved disastrous. Thus the hitherto obscure stages in the further history of toxins and antitoxins are directly brought before the eye of the investigator.

Jequiritol. Subcutaneous injections are absorbed much more rapidly than conjunctival instillations. The therapeutic value of the drug is dependent not only upon this slow absorption but upon a high concentration of toxic substance. The more gradually absorption progresses, the more unlimited become the therapeutic powers; were absorption as prompt as after subcutaneous injections where toxins and antitoxins are rapidly formed, the desired inflammatory reaction would not repeat itself often enough to be of benefit. Focal immunity always antedates general immunity. According to Roemer, the conjunctiva only contributes part of the antitoxin, the rest being supplied by the blood forming organs.

This active immunisation by jequiritol renders possible a study of the principle of acquired immunity in man.

The Infectious Corneal Ulcer (*Ulcus serpens*). While in pneumonia a marked general reaction usually follows with the formation of many protecting bodies, in serpiginous ulcer the general reaction to the pneumococcic infection is slight, no anti-bodies being found in the blood. Recent bacteriological researches show that in cases where the microorganisms are limited to a small area and from here produce their toxins (diphtheria, tetanus) the organism responds with the formation of antitoxins, in other diseases when the danger lies in a rapid increase of bacteria, specific bacteriolytic antibodies are developed.

With this in mind, Roemer in several cases of ulcus serpens injected anti pneumococcic serum, attempting by this means to establish a passive immunity. The results were far from being satisfactory. His next thought therefore was to imitate the natural process of immunization, by combining passive immunization with the active immunization, the latter being obtained by injections of specially prepared pneumococcus cultures. Inasmuch as active should precede passive immunization, the serum is injected subcutaneously, the culture into muscle tissue, intramuscular injections being most rapidly followed by agglutinin formation, which with the bacteriolysins formed strive to resist the infectious process.

According to Ehrlich, besides specific antibodies, complements are necessary for bacteriolysis. The latter Roemer believes are formed in the leucocytes and then liberated into the blood stream. Without antibodies however the complements are helpless, which accounts for the progression of the ulcer in the direction of greatest infiltration, where in reality the formation of complements is most active.

As 95% of all cases of serpiginous ulcer are pure pneumococcus infections, the serum therapy should theoretically at least be the most efficient means, not onlv of combatting the disease but of furnishing prophylaxis. Too few cases have thus far been subjected to this method to deduce general practical references. Axenfeld's statistics include thirteen cases, Roemer's twenty-four cases treated bv the combined method.

Hemorrhage Into the Viterous. The hemolytic virtues of certain animal sera for human blood, he suggests as a possible therapeutic measure in such affections. Eschnig's trial of such serum in a case of vitreous hemorrhage and retinal detachment was followed by disastrous results.

Senile Cataract. Roemer applies his theory of immunity to the pathogenesis of senile cataract, arriving at quite original conclusions. He compares the hemolysis of the red corpuscle with the changes observed in cataract. While traumatism may provoke destructive changes in both, such alterations may also be induced by specific cytotoxins. The theory that senile cataract is the result of these cytotoxins (leutotoxins) is perfectly reconcilable with the clinical picture of the disease. the first portions of the lens to be affected being the eauator, where there is the greatest secretion of cytotoxins. and the posterior surface, where there is no protecting epithelium.

That the retrograde changes do not result in every individual is attributed to the protecting influence of the ocular secretory apparatus, the vessel walls and pigment epithelium of the ciliary processes. In old age when degenerative changes affect the whole organism this influence is more or less in abeyance. Roemer was also able to demonstrate in the lens fibres, receptors which acting as antibodies, neutralized toxins; in the lens protoplasm, agglutinating and antihemolytic properties were revealed.

Sympathetic Inflammation. Roemer's remarks are chiefly directed against the ciliary nerve theorv of Schmidt-Rimpler. Roemer bases his conclusions upon the fact that the aqueous humor under physiological conditions is free from cytotoxic elements, and that the appearance of abnormal constituents in the aqueous constitutes a proof of vasomoter disturbance. To simulate the conditions in sympathetic inflammation, he inoculated an eye with non-pathogenic háy bacilli; chronic uveitis followed and hemolysins were constantly present in the aqueous; in the fellow eye no hemolysins were found. A corneal puncture of this eye, however, immediately resulted in the formation of hemolysins, going to show that the conditions of nutrition in the two eyes are independent of each other and that the ciliary nerves are not influenced reflexly.

He believes that the inflammation finds access to the fellow eye by way of the blood current, resembling in this respect non-traumatic uveitis.

Biological Properties of the Pigment Epithelium and Retina. To establish the relations of normal serum to the pigment epithelium and retina, Roemer mixed a serum whose hemolytic virtues were known, with a filtrate of pigment epithelium and retina. Examination of the blood revealed a neutralization of the hemolysins. Such anti-hemolytic elements Roemer was able to demonstrate in the pigment epithelium and retina of man.

Though Roemer's deductions are still largely hypothetical, they suggest great practical possibilities. The establishment of abrin immunity and the combined immunization against the pneumoccocic infection have already demonstrated the value of applied principles of immunity in ocular therapy.

A. C. S.

A Contribution to the Treatment of Basedow's Disease by the Antithyreoidin Serum of Moebius.

GEVERS LEUVEN. (*Müenchener medizinische Wochenschrift,* August 7, 1906.) Gevers Leuven reports the history and clinical findings in a case of Basedow's Disease. The patient had received about 90 c. m. of serum in all. but decided improvement did not set in until this treatment had been abandoned and a general tonic treatment substituted. Whether the specific action of the serum really influenced the course of the illness, he is unable to say, a sister of the patient having recovered from the same disease without specific treatment. At any rate, he concluded, the case yielded additional evidence that the serum therapy is entirely free from dangerous consequences.

A. C. S.

A Case of Basedow's Disease Without Exophthalmos Treated by Antithyreoidin Moebius.

ARONHEIM. (*Müenchener medizinische Wochenschrift,* August 7, 1906.) The author reports a case of struma in a woman thirty years of age. Besides dyspnoea, anoxexia, malaise, and a feeling of oppression, there were symptoms suggestive of tuberculosis—cough, expectoration and fever. The right and left ventricles were found enlarged, the pulse 90 and rather irregular. No tubercle bacilli were discovered in the sputum.

There was no exophthalmos. Nothwithstanding this, Aronheim suspected an atypical form of Basedow's disease and advised the administration of Antithyreoidin Moebius. He briefly refers to his report in the *Wiener Klinische Rundschau*, No. 4 of two typical cases of the disease in which he used the serum with marked benefit.

In the case under consideration, this treatment was equally efficacious. The general conditions improved rapidly, the cardiac dilatation decreased, the pulse became regular and less frequent, dyspnoea and cough abated and the temperature returned to normal. Although the serum treatment had no effect upon the size of the struma, the results as a whole verified the original diagnosis. A. C. S.

The Treatment of Parenchymatous Keratitis by Hetol.

COHN. (*Müenchener medizinische Wochenschrift*, June 19, 1906.) Hetol or sodium cinnamate was first tried by Landerer in tuberculosis. Its administration is followed not only by a general hyperleucocytosis but by an inflammatory reaction around the tubercles eventually terminating in fibrous tissue formation.

Subconjunctival injections of hetol were used by Pflüger in various ocular inflammations. In parenchymatous keratitis, especially during the acute and subacute stages, with or without iritis, this method of treatment associated with a massage of the cornea, was followed by beneficial results. In kerato-uveitis of tubercular origin Pflüger claimed to have had the most success.

Cohn reports two cases of parenchymatous keratitis treated by hetol. He did not resort to subconjunctival injections, but merely instilled the drug into the conjunctival sac. Atropine was also instilled. One case was subjected to this treatment during the very incipiency of the disease, the other not until the subacute stage had been reached. Though iritis complicated both conditions, the symptoms under this treatment rapidly declined.

Whether the cases in question were tubercular or the sequelæ of hereditary lues, the author does not know for certain. He suggests that hetol possibly has no specific action, the leucocytosis acting auspiciously in inflammations not necessarily tubercular. A. C. S.

The Bier-Klapp Suction Appliance,As a Substitute for the Heurteloup Apparatus.

PETERS. (*Die Ophthalmologische Klinik*, March 1, 1906.) Peters has found the Heurteloup apparatus of service in chronic inflammations of the retina and chorioid and in central myopic affections without changes in the vitreous; in fact, he prefers this therapeutic measure to subconjunctival injections, diaphoretics and mercurials. He attributes his success by this method to a withdrawal of blood to another part rather than to an actual loss of blood. The dark treatment which, however, the Heurteloup Apparatus necessitates, makes it very objectionable to some patients. Peters accordingly experimented with small bell glasses to which he attached rubber bulbs (Bier's method). These he applied to the temporal region, eight to ten minutes at a time, with marked benefit. The advantages over the Heurteloup apparatus are:

(a) No scarring is produced.
(b) No dark treatment is necessary.
(c) The patient is able to apply the contrivance himself.

Recently the author has devised a smaller cup which he attached to a rubber bulb by a 20 c. m. long rubber tube. The patient now holds the bulb in his hand, and at the same time is in a position to guard against possible breakage following detachment. The cups should be applied every two or three days for three weeks. A. C. S.

Argyrol in Ophthalmology.

HINSHELWOOD. (*Die Ophthalmologische Klinik,* April 5, 1906.) Of all the silver preparations, argyrol has proved to be the most efficient. Even 20 to 30% solutions produce no irritation; on the contrary marked relief often follows their application. Solutions which have been exposed to light rays are irritating, but retain their germicidal properties.

In granular conjunctivitis, Henshelwood instills a 20% solution two, three and four times daily. If the secretion is abundant he everts the lids and brushes ("brosser") with a 30% solution once a day. As soon as the secretion diminishes he resorts to the copper stick, argyrol being still administered but less frequently.

In ophthalmia neonatorum he has given up silver nitrate entirely in favor of argyrol. The applications can be left to the parents without compunction on the physician's part. After cleansing the conjunctival sac with boric acid he orders argyrol (20%) to be installed every two, three or four hours according to the severity of the case. Some cases may in addition demand applications to the averted lids. The indifferent action of argyrol upon carneal tissue renders it a valuable preparation in corneal ulcerations. In infectious corneal ulcers he recommends an ointment consisting of argyrol .5, holocain, .05 atrop. sulph. .02, vaselin 8.00.

In blepharitis after removal of the crusts, the lid margins should be vigorously brushed with a 30% solution until the roots of the cilia become thoroughly impregnated.

In dacryocystitis he injects into the sac 10, 15 and 20% solutions of argyrol. Care must be exercised not to inject the solution into the surrounding cellular tissue. The resulting infiltration is absorbed very slowly and always leaves behind a faint greyish discoloration of the skin. Mere instillations into the conjunctival sac act favorably, if the canaliculus is slit and a communication between the lacrimal sac and the nose be established.

Long continued use of the drug will cause a slight argyrosis.

A. C. S.

Concerning the Nature of Simple Pigmentary Atrophy of the Retina.

FERENTINOS. (*Die Ophthalmologische Klinik.* March 20, 1906.) According to Ferentinos, this affection is neither a degeneration nor an inflammation, but a simple atrophy of the retinal cells brought about by physiological conditions. Recapitulating his views based on these principles he remarks that though every living organism is bound to perish, all similar organisms do not die at the same time, nor do all organs of the same individual surrender their vital functions simultaneously (thymus, ovary, etc.).

In pigment atrophy of the retina this involution takes place early. The functionally less active regions are affected sooner than the more highly developed portions of the retina. Gradual loss of function is associated with a gradual diminution in the caliber of the vessels, supplying the retina. Before, however, the vascular contraction has adapted itself to the now lessened demands of the retinal cells, the connective tissue receiving more than its usual supply of blood, proliferates.

During further vascular regression, proliferation is followed by shrinkage, the amount of contraction depending upon the degree of adaptation. A. C. S.

Alypin.

M. FISCHER, Budapest. (*Gyogyaszat.* No. 7. 1906. Ref. in *Wochenschr. f. Ther. und Hyg. des Auges,* Apr. 19, 1906) reports satisfactory results from the use of Alypin in the Budapest clinic. A 3 per cent solution causes a burning sensation, which lasts forty to sixty seconds, but the cornea is found to be anesthetic as soon as the discomfort is over. If the eyelids are held open after the instillation, so that the solution cannot be squeezed out, one drop is sufficient. Its great advantage over cocaine, therefore, is its rapidity of action. Foreign bodies can be removed immediately. No injurious effects upon the corneal epithelium have been observed. In chalazion operations, one or two drops diminish greatly the painfulness. It has very little effect, however, in relieving the discomfort of probing the lacrimal duct. In iridectomies three or four drops produce an anesthesia of the iris, and the hyperemia of the conjunctiva can be obviated by the use of one of the suprarenal preparations. It does not dilate the pupil, and therefore the tonicity of the iris is better. and it is less apt to be caught in the wound. In enucleation its sole advantage over cocaine is its lessened toxicity. Fischer thinks the introduction of the drug is a decided advance in ophthalmology.

E. A. S.

The Treatment of Myopia.

SATTLER, PROF. H., Leipsic (*Ref. in Wochenschr. f. Ther. n. Hyg. des Auges,* May 31, 1906), in an address before the Fifteenth International Congress in Lisbon, April, 1906, recommends very strongly the giving of the full correcting glass in myopia, even of low degrees. With this it is usually possible to prevent the myopia from advancing, provided that the children are watched and prevented from holding their books too close, and from bending over their work; and provided also that a good light is always secured. In young people the full correction of a myopia of 10 D and over is generally well borne, and if the myopia progresses, it is usually to only a slight degree. Even in high grades of myopia a correction should be ordered which will give a working distance of 20 to 25 cm., that is, a reduction of only 3 or 4 D. from the full distance correction. This he considers a protective measure against the occurrence of serious complications such as retinal hemorrhage or detachment. Almost all the cases of nontraumatic retinal hemorrhage and detachment which he has observed have been in patients who have worn an insufficient correction for near work. Usually the asthenopia from insufficiency of convergence is removed by the glasses which increase the distance of the near point, and thus restore the equilibrium between convergence and accommodation. A slight remaining insufficiency may be relieved bv decentering the lenses, and if there is a decided faculative divergence, a cautious tenotomy of one or both external recti should be performed. In myopia above 18 D. he recommends strongly the removal of the lens by primary extraction which up to the 30th year he performs by means of a hollow knife, according to the method advocated by Hess. He considers this method superior to Fukala's discission operation because:

(a) Fewer operations are necessary.

(b) The healing is incomparably more rapid, and vision is often restored within two weeks.

(c) Loss of vitreous is less frequently encountered.

(d) Increase of tension and its consequences are almost always absent.

(e) There is a lessened danger of postoperative retinal detachment, and the ultimate results are therefore better.

Of 174 eyes operated upon during the past eight years, 148 (85%) had a vision equal to or better than the original vision, while in 70% a decided improvement was obtained. Sixty-five cases out of 148 were under observation for from three to eight years after operation. Out of a series of 148 cases operated upon by discission, 67.6% of the cases which could be followed for at least three years (seventy-three in all) showed an improvement in vision, and 9.46% the same vision. In 22.94% there was a lowering of vision, and in 8.1% retinal detachment. The original expectation, therefore, that the operative treatment of high myopia would prevent an increase in the axial measurement has not been entirely fulfilled. Much less could the hope expressed by Vacher before the Moscow congress be fulfilled, that the serious complications of high myopia would be avoided by operation. The appearance of vitreous opacities, chorioidal and retinal hemorrhages, and to some extent the retinal detachment are dependent upon the anatomical changes present in the near-sighted eye, and these are not influenced by the diminution of the refractive condition.

Sattler does not believe, however, that operation increases the vitreous opacities or fundus changes. As to retinal detachment, he has seen it occur in 4.6% of the cases during the last five years, a percentage which is probably not greater than in an equal number of highly myopic eyes which have not undergone operation. The cases for operation must be carefully selected, and the technique of the operation (preferably primary extraction) must be faultless. E. A. S.

Concerning Metastatic Carcinoma of the Chorioid.

KORWALEWSKI (*Zeitschrift f. Augenheilkunde,* Vol. xv, p. 21) reviews the literature of this rare malady, and reports a case occurring in a forty-eight year old woman in whom the right breast and axillary glands had been removed about four years previously. The right eye was first affected, the carcinomatous mass occupying the temporal side of the eyeball from the ora serrata to two disk diameters from the macula. Tension was plus 1. The left eye was then normal. About seventeen days after enucleation of the right eye, she had an epileptic fit which lasted ten minutes, and was followed by vomiting and intense headache. Half an hour later she had a similar attack lasting fifteen minutes. There were no prodromes. There was no recurrence of the epileptic attacks, but the patient suffered from intense headache, vomiting and vertigo.

The microscopic examination of the right eye showed metastatic carcinoma. The left eye remained normal until two months later, when the optic nerve became swollen, and later was surrounded in a radiating manner by band-like hemorrhages. The symptoms of brain involvement were increased later by the development of palsy of the abducens, and intermittent exophthalmos.

The patient died about five and a half months after the enucleation, and the autopsy showed general carcinomatosis.

The author believes that the occurrence of metastasis of carcinoma in the chorioid indicates general metastasis and shows the futility of operative interference. F. K.

The Etiology and Genesis of Hole Formation in the Macula Lutea (Retinitis Atrophicans Centralis, Kuhnt.)

WILH. REIS (*Zeitschrift f. Augenheilkunde*, Vol. xv, p. 3) reports four cases in which the "lochbildung" (literally, hole formation) in the macula was preceded by some trauma, which the author believes was the exciting cause. In view of the possible formation of this incurable malady with its destruction of central vision some years after the injury, the importance of its observation is manifest.

He thinks that the hole formation is always preceded by an edema in the centre of the retinal layers, forming later a *hydrops retinae*. This hydrops may be mechanical (congestion during or after birth; vascular palsy due to contusion; alteration of the vascular wall after use of Roentgen rays) or dyscrasic (alteration of vessels due to constitutional causes; arteriosclerosis, syphilis, nephritis).

The breaking of the anterior walls of the cyst formation results in retraction and atrophy, the final result being a sharply defined round or oval hole in the situation of the macula.

F. K.

Complications of Heterochromia.

FUCHS (*Zeitschrift f. Augenheilkunde*, Vol. xv, p. 191) retains the name of heterochromia for different coloring of the irides, instead of the name suggested by Weil, namely, heterophthalmos, which Fuchs considers inappropriate.

The different colorings are due to the pigment in the iritic stroma and not to the retinal pigment layer on the posterior surface of the iris. The latter may, however, also be affected in this disease. Fuchs observed thirty-eight cases. The color of the patient's hair was uniformly dark brown or black, though the irides were blue.

In thirty-three of his thirty-eight cases, cataract was present in the paler eye, the posterior cortex being generally affected. He never saw the star-shaped or rosette form of opacity, but usually a dust-like or cobweb-like opacity.

In twenty-nine cases he noted precipitates on the posterior surface of the cornea. The pupil was usually dilated and reacted sluggishly to light. The picture of chronic serous iritis was presented, and various other changes were observed histologically in the structures of the iris which were due to chronic cyclitis, though clinically no evidence of inflammation had been present. Opacities in the vitreous chambers were frequently present, but could not be perceived on account of the anterior opacities.

The micro-anatomic examinations of pieces of five irides, and of two whole eyes, confirmed the above views, and leads him to conclude that the frequent association of heterochromia, cyclitis and cataract is not accidental. Etilogically:

1. The lighter color of the iris may be due to cyclitis.

2. The lighter color of the iris may be present first, the other changes following.

(a) The lighter color iris may be a freak of nature.

(b) The lighter color is pathologic, whereby, through an unknown cause, the iris has not received its normal amount of pigment.

1. Such an eye is a *locus minoris resistentiae*, whereby it is more readily inflamed, and the production of cyclitis and cataract is facilitated by lessened resistance.

2. The unknown cause of the lack of pigment may produce the inflammation of the eye at a later date, causing,

(a) Cyclitis, as result of which cataract is formed.

(b) Primarily cataract and cyclitis. F. K.

The Surface and Vessels of the Iris.

KOERBER (*Zeitschrift f. Augenheilkunde*, Vol. xv, 1906, p. 110) discusses the different appearances of various pigmentations of the iris. The arteries and veins have very thick walls and in lightly pigmented eyes form the support or web of the iris. Blood vessels are frequently visible physiologically. In irides rich in pigment, the interstices between the vessels are filled with a more dense adventitious stroma.

Pathologically, blood vessels in the iris are visible in

1. New blood vessels in iritis and glaucoma.
2. Incomplete development of the anterior layer of the iris, the nearly normal vessels having very thick walls and narrow stream of blood.
3. Angiomatous malformation, vessels having thin walls and broad blood current.

F. K.

Concerning the Occurrence of Amyloid Degeneration in the Eyeball and Ocular Vessels.

v. Michel (*Zeitschrift f. Augenheilkunde,* Vol. xv, page 13) reports microscopic findings in a case of interstitial nephritis, with amyloid degeneration occurring in an eighteen year old man. The patient was seen twelve hours antemortem. There was a nearly total bloody detachment of the retina, with the exception of a small medially placed area. As the retina contained many small whitish shining spots, the diagnosis of detachment of the retina in interstitial nephritis was made. The general symptoms were intense anemia, edema of the lower extremities and cardiac hypertrophy associated with great amount of nosebleed.

The autopsy showed high-grade cirrhotic kidney on both sides, with decrease in size of the entire organ and widespread amyloid reaction.

There was also much sclerosis of the arteries of the brain, the internal carotid and arteries of the base of the brain, with edema and anemia of the brain. Only the posterior half of the ocular globes could be removed for examination. The section of the eye was followed by the exudation of a bloody fluid, thin and dark colored. The chorioids were apparently suffused with blood, the optic nerve entrance prominent. The latter and the approximate retina were cloudy and dotted with small hemorrhages and white spots.

Microscopically, there was an extensive hypertrophy of the intima of the central artery of the retina and its branches in the nerve head; also in the arteries of the coverings of the optic nerve, with a small cell infiltration of the connective tissue and pia mater.

The retina shows edema without change in its vessels. The chorioid on the contrary showed many vessels affected with endarteritis, in some places intensely so. In the peri-chorioidal space there were many small hemorrhages.

The iodine reaction showed amyloid degeneration of arteries affected by endarteritis in the central artery of the retina and its forks, in the arteries of the pia mater of the optic nerve, in the affected chorioidal arteries, and in the choriocapillaris. F. K.

The Foundation of My Teaching Regarding Myopia.

J. Stilling (*Zeitschrift f. Augenheilkunde,* Vol. xv, p. 1) believes that his views on the origin of myopia have been grossly misunderstood. Myopia, caused by straining at close work, is due to the relative increase in the long axis of the eye under pressure of the ocular muscles. It is not to be understood that the pressure of these muscles upon the globe for a prolonged time, and even frequently repeated, produces an irretrievable change in the shape of the eve. Much more likely is it that the lateral pressure of the tendons upon the growing eye prevents the growth of the eye in these directions, so that the eye will be forced to grow more in the directions of least resistance, anteroposteriously, whereby myopia is produced.

The action of the recti is to draw the globe posteriorly against the orbital fat, and thus shorten the axis of the eye, while the oblique muscles have the tendency to draw the eyeball forward and lengthen the eye. It is therefore the pressure of all these muscles upon the growing eye that can cause myopia, as the least resistance is anteriorly. F. K.

Later Results of the Operative Treatment of High Degrees of Myopia.

Pause (*Zeitschrift f. Augenheilkunde,* Vol. xv, pp. 115 and 212) analyzes the results of forty-six cases of high myopia treated by extraction of the lens. He was able to find only twenty-four of forty-two cases operated previous to 1894 and reported by Pflüger. In these twenty-four cases, seventy-two operations were necessary to obtain final results. In no case did detachment of the retina occur, and only one eye lost its central vision. The results were uniformly good.

He concludes:

1. That the question of the operative treatment of high myopia should be decided by the age of the patient, the degree of myopia, the refraction of the cornea, the vision and the history of the development of the myopia.
2. To estimate the result of aphakia upon the refraction of the eye, it is necessary to know not only the total refraction,

but also the refraction of the cornea, which should therefore always be measured.

3. The vision of the operated eye has invariably risen generally two to four times, and in one case to five times the previous vision. The increased vision is due to increase in the functional power of the retina.

4. The operation gives better results the earlier it is instituted in progressive myopia.

5. Central fresh and old chorioidal changes are not a contraindication to operation, but on the contrary central vision can often be saved thereby.

6. The removal of the lens does not stop the increase in the axis of the eye, but lessens its rate of increase.

7. The superiority of the linear extraction over Fukala's method has not been proven. F. K.

The Division of the Ciliary Nerves Without Injury to the Optic Nerve.

Fick, A. E. (*Zeitschrift f. Augenheilkunde*, Vol. xv, p. 51, 1906) relates several cases in which the pain and inflammatory phenomena of cyclitis were relieved permanently by division of the posterior ciliary nerves, without injury to the optic nerve. He believes this operation to be an invaluable addition to our treatment of cases of intractable and creeping cyclitis, which are probably due to inflammation of the ciliary nerves. This inflammatory reaction extends to the ganglia, which exert a centrifugal irritation on the nerves of the blood vessels, by means of which the inflammation is continued and increased. The fact that the pain continued in the operated eyes from one to two weeks, in spite of the division of the ciliary nerves, in his opinion, confirms his hypothesis. F. K.

The Geographical Distribution of Trachoma in Hungary.

Scholtz, K. (*Zeitschrift f. Augenheilkunde*, Vol. xv, p. 105) presents a map of the regions most affected by trachoma. He believes that in the northern sections of Hungary, the larger degree of trachoma is due to the homecoming of emigrants from America, where the sanitary regulation of this disease is much more lax than in Hungary. Those regions of the country from which emigration has been slight, show but few cases of trachoma. F. K.

ABSTRACTS FROM FRENCH OPHTHALMOLOGICAL LITERATURE.

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Another Set of Test Types.

ARMAIGNAC (*Soc. Franc. d'Ophtal.*, May, 1906) adds another to our already extensive supply. A. has worked out a series that is neither in exactly arithmetical nor in strictly geometrical progression. The terminals of his series are letters respectively 7.3 mm. and 73 mm. high. The height in mm. of the series ranges as follows: 7.3, 9, 12, 16, 22, 29, 38, 48, 60 and 73. These have an angular value at 5 meters, respectively: 5', 6', 8', 11', 15', 20', 26', 33', 41', 50', and represent a visual acuity respectively: 1.0, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, 0.1.

[Under the old-style numeration, the nearest approximates are, respectively: 20/20, 20/25, 20/30, 20/40, 20/60, 20/80, 20/100, 20/130, 20/160, 20/200.]

A. claims that this series presents to the eye a regular, harmonious progression in which the gradation seems perfect, each letter differing from that which precedes and from that which follows by a quantity which appears equal from one end of the scale to the other.

He uses the usual block letters of Snellen, but recommends confining them to the simpler and similar forms like O, C, U, V, D and G. Or still better, use only O and C, with the opening of the C varied in direction: up, down, right or left. This would make them useful as tests for illiterates as well.

[With Snellen's and Monoyer's adherents, with Sulzer and Armaignac in France, and Williams in America working this question anew, and with others of less note in the field, it is quite time that the next International Ophthalmological Congress take up this matter and give us an official and authoritative test-card once and finally.]

Determination of the Color Sense.

TSCHERNING (*Soc. Franc. d'Ophtal.*, May, 1906) presented two instruments for the determination of the color sense. The one, based on the principle of chromatic polarisation, belongs to the same group as the older instrument of Chibret. In this there is a plate of quartz, cut parallel to its axis, placed between a Nicol and a bi-refrecting prism. This gives two fields of complementary colors, and the tint is varied by changing the inclination of the quartz. T. has modified it by cutting the quartz perpendicular to its axis; and obtains the variation in tint by rotating the Nicol. The color fields are larger and brighter than in the apparatus of Chibret.

The other is a more complicated instrument, based on the spectral principle. It consists essentially of a ruled plate placed between two collimaters, with a mirror reflecting the flame of a lamp through the window of the first collimater, and throwing a small spectrum upon the plate of the second collimater with the yellow band coinciding with its window. The observer, looking through this window, sees the plate illuminated by yellow light. Before the lens of the second collimater adjusts a ground plate with two openings, the one square, the other circular. The former is for testing the red and green-blind.

A bi-refracting prism before the window doubles this opening and also the spectrum. The red of one and the green of the other of these spectra are made to adjust in such a way that the observer sees a red square and a green square. A small Nicol permits the variation of these so that any apparent differences may be removed by turning. The position of the Nicol then indicates either red or green blindness.

The more marked degrees of color defect are detected by bringing in the circular opening and removing the larger bi-refracting prism. This opening has the right half provided with a faintly smoked glass to soften slightly the yellow light; and its left half with a smaller bi-refracting prism. This superimposes the two spectra, so that one sees only a mixture of red and green light. By turning the Nicol the intensity of this mixture may be made to coincide with that of the yellow light in the other half.

Cases of abnormal trichromasia are revealed with the greatest facility.

Spontaneous Hemorrhage Into the Orbit In Women.

BRUNETIERE (*Soc. Fran. d'Ophtal.*, May, 1906) reports two cases of spontaneous hematoma of the orbit, occurring in young women, without any previous trauma or morbid predisposition. The hematoma appeared in one case three days after the weaning of the child. It coincided in the other case with the sudden suppression of menstruation; and it recurred during nearly a year at each menstrual period.

B. considers these hematomas as true compensatory hemorrhages. They are dependent upon vaso-motor troubles, of possibly toxic origin, and taking their point of departure from the genital or glandular system of the woman.

The prognosis of these cases is often grave; and loss of vision is not rare. If the extravasation shows a tendency to cease and undergo spontaneous absorption, intervention is not so important; treatment for the relief of pain being the main essential. But otherwise energetic treatment may become necessary to check the hemorrhage, and especially to prevent the dangers which result from pressure on the optic nerve.

Traumatic Enophthalmus.

CHILLOUS (*Soc. Franc. d'Ophtal,* May, 1906) reports the case of a man of 28 who received a violent blow, with the handle of a shovel, in the orbital region of the right side. He lost consciousness for only a couple of minutes. During the first days there was epistaxis and hemoptysis; and the eyelids became swollen and painful.

This swelling persisted for about a dozen days; the pain longer. After disappearance of the swelling, the globe appeared sunken and a little depressed; about 10 mm. enophthalmus and 2 mm. depression. Mydriasis, cloudiness of the media, which cleared up after two weeks; diplopia and two small hemorrhages at the superior margin of the disc. Some narrowing of the visual fields.

There was a wound and a depression of the bone at the inner orbital margin; and a radiograph showed a pushing backward of the ascending portion of the superior maxilla. Treatment unavailing.

Osteo-Periostitis and Sinusitis Following Diphtheria.

MOISSENIER (*Soc. Franc. d'Ophtal,* May, 1906) reports the case of a young girl of 17, in whom, five weeks after an attack of diptheria, there developed a phlegmonous inflammation of the right eyebrow. An incision emptied pus, and the probe showed bone bare of periosteum; but did not enter the sinus. By this time any characteristic bacilli had disappeared; only staphylococci being found. The wound seemed to heal normally.

Two weeks later there was a fresh inflammatory attack. The anterior wall of the sinus broke down, giving issue to a characteristic ropy fluid. The radical operation being determined upon, a long curved incision, paralled to the eyebrow, was made, uncovering the region of the sinus. A large sequestrum, 2x2½ cm., was removed; and the remainder of the anterior wall resected with cutting forceps. The mucous lining was curetted. The fronto-nasal was probed, and the cavity drained by gauze. Healing normal.

Eighteen days after, a fresh attack of inflammtaion, with the elimination of a small sequestrum. After apparent healing, a third attack of inflammation again occurred.

This was followed by permanent healing; with a slight depression of the surface at this point.

Elephantiasis of the Lid From Repeated Erysipeloid Attacks, With Sinusitis Maxillaris.

FROMAGET (*Soc. Franc. d'Ophtal,* May, 1906) reports the case of a woman of 54, who had had, since 1903, eighteen or twenty attacks of erysipelas (?). These had always occurred during the time of menstruation, but not in regular successsion.

They involved the face and lids, and had always begun on the left side, and the tumefaction was always more marked on this side. But they later invaded the right side as well. The inflammation had been accompanied by a swelling of the left sub-maxillary gland.

About the same time she noticed a watery discharge from the left nostril. During the last three months this had become offensively purulent. Examination of the nose, diaphanoscopy and puncture demonstrated the existence of a purulent maxillary sinusitis, left side; the pus removed being thick, greenish, yellow and fetid.

After four or five attacks there appeared a swelling of the left lid, and a year later this invaded the right. Under the influence of the repeated attacks this swelling increased steadily. At this time the patient presented in each eye a tumor occupying one end of the lid to the other. The skin is glossy and somewhat thickened. The swelling remained constant and had never diminished. Pressure gives no pain.

Under the treatment of the sinusitis the swelling had considerably diminished. A month before the meeting, under local injection of cocaine, a large fold of the swelling in the left lid had been removed. Healing was by first intention. F. argues that acquired elephantiasis is not always a morbid entity; but may be the equal of repeated attacks of erysipelas or other inflammations.

In this way the oedema becomes chronic and the vascular and lymphatic changes become fixed. This permanently thickened state of the skin constitutes elephantiasis. In this case the starting point of the attacks of erysipelas was undoubtedly the maxillary sinusitis.

Tumors of the Lachrymal Sac.

ROLLET (*Soc. Franc. d'Ophtal.*, May, 1906), who has had extensive experience in ablation of the lachrymal sac for rebellious dacryo-cystitis, reports three cases of non-ulcerating "cancer" of the sac. Two of these were primary, the other secondary. In the first two cases one appeared to be in the presence of a simple lachrymal tumor, and only after the removal of the sac and cutting it open was the neoplasm revealed. The union and healing in both was prompt. The first case was 65 years old; the growth was diagnosed as a "epitheliema atypigue." The second case was 61; the growth was diagnosed as a "polype sarcomateux" (examinations by Prof. Aurand). Neither of these cases had been treated by probing, and the accompanying dacryo-cystitis was secondary and not initiatory. The diagnosis of these practically latent growths is in the early stages extremely difficult; and the possibility should always be kept in mind in any lachrymal sac tumor in an aged person. Fortunately they are rare, Lagrange having found reports of but four cases of sarcoma and two of epithelioma. [But Rollet alone having seen three cases seems to indicate that they may be more frequent than the published reports would indicate, and have been overlooked.]

In the third case there was a small dark tumor, well defined. Extirpation and prompt healing. This was found to be an alveolar melanotic sarcoma. The eyeball had been enucleated a few months before, for a melanosarcoma of the chorioid. There was also melanosis of the nasal fossa. So that the growth had developed, in a sense, in centinuity. R. removes the sac whole; has made 200 enucleations, and strongly advocates the early radical operation.

Entropion Operation, With Removal of Tarsus.

GALLEMAERTS (*Soc. Franc. d'Ophtal,* May, 1906) proposes a modification of the Kuhut method for the extirpation of the tarsus by the conjunctive route. The lid everted, a nearly straight needle (slightly curved near the tip), is entered at the upper border of the tarsus, passed between the tarsus and the orbicularis, and brought out near the free border of the lid. Two others are passed in the same day, to each side of this nearer the angles. With a bistoury an incision is made through the conjunctiva the entire length of the lid, about 2 mm. from the free border, not invading the tarsus. The conjunctiva is dissected up as far as the upper border of the tarsus. Grasp the upper border of the tarsus and dissect it

free; completing this dissection with
ing as guides. Replace and stitch th
needles and tie the threads loosely (
may generally be removed the follo
part of the operation is for but a few

The removal of the tarsus rend
easily retains the position secured b
its pressure on the eyeball; allows th
even increases the free movement of

Retraction of the Le

TRUC (*Soc. Franc. d'Ophtal,* Ma
case of old retraction of the levato
deformity was extreme, and relief
reasons alone. Various plans of trea
T. made a free division of the leva
to the tarsi of the lids. The operatio
perfectly effective. Case illustrated

Motor Anomali

BOUCHART (*Soc. Franc. d'Ophtal*
mode of muscle testing. He uses t
prism of 6° with base down, or a pri
always before the left eye. Among
many cases of muscular instability.

[To Americans making office use
phorometers or phoro-optometers as h
ophthalmoscope or any other ever
ingenous enough to be touching.]

Muscle Advancem

BOURGEOIS (*Soc. Franc. d'Ophtal,*
operation (that is practically our "t
exposes the tendon, and frees it by p
beneath it and working it up to th
"vivifies" it by scraping the exposed
sharp curette. He passes two sutures
and the other through the lower pa
he places a small silver spatula upon
forceps pulling forward the posterior
wound, presses the tendon back; thus
The sutures are tied, and the spatul
suture is then passed through the cen
allowed to remain and absorb; the tw
on the seventh or eighth day. Simple

Employed in twelve cases the procedure was simple and proved effective.

[Our operators might give the spatula a trial; and our foreign confreres might try some form of our "tucking" forceps.

Motais, whose admirable researches on the ocular muscles are so well known, proposes a new operation for advancement. He claims that the dosage can be absolutely guaged; and that the attachment is perfectly fixed.

M. covers and frees the tendon. Drawing its upper edge out of the way he passes a suture through the superficial layers of the sclerotic at right angles to the tendon, and just back of where the new insertion is to be. This traverses the sclerotic for about 1½ mm. with a "bite" deep to secure a firm hold. Then he severs the upper two-thirds of three-fourths of the tendon; draws it forward just the required amount, and ties this suture tightly around it. Then he passes a similar suture across the path of the lower portion of the tendon; severs it, and draws it forward and ties it.

These two strips of tendon, strangled transversly, remain fixed at the point chosen with absolute precision and permanence.

Simulation in Strabismus.

Delord (*Soc. Franc. d'Ophtal,* May, 1906) narrates a case that is interesting; but important only in countries with compulsory military service. A young man, of educated family, with extreme concomitant squint, had by persistent and regular exercise maintained the nearly normal visual acuity of the squinting eye. To escape military service he simulated an amblyopia high enough to come within the degree required for exemption. This grade of amblyopit, not unusual in such eyes, and quite to be expected, was certified to by one of the most eminent ephthalmologists.

Ocular Traumata.

Desbrieres and Bargy (*Soc. Franc. d'Ophtal,* May, 1906) give their statistics; interesting as showing the conditions in a small manufacturing town. Of 1,506 cases 392 were trauxmatic; 26%. Of these 350 were foreign bodies, wounds or ulcers of the cornea or conjunctiva; 89%. Fifty-two histories are given, only a few of any great interest; toleration of a piece of steel in the vitreous, with V of ½; blow from a piece of copper, crushing the anterior wall of the frontal sinus, and separating free the pulley of the superior oblique; intra-orbital aneurism from thrust of a stick, with cure by compression of the carotid.

They favor injections of perman
and touching of wounds, etc., with a

Argyrol In Conjunc

Carra (*Soc. Franc. d'Ophtal,* Ma
of the use of argyrol in 64 cases of
junctivitis, i. e., purulent, granular, fr
form, vernal, eczematous, strumous
itis. He strongly recommends it in
did not give encouraging results in th
bactericidal power to be only 1-10
and Neisser admits this. He uses
and oily collyria of 5%; employing
hours, according to the case.

Keratectomy With Cor

Fage (*Soc. Franc. d'Ophtal,* May,
fied and improved operation for rem
in staphyloma, etc. He separates th
entire border. Then incises the co
Graefe knife. Close to the lines
minimum removal of cornea he pas
above downwards.

Then he removes the cornea nec
after discission of its capsule; and
away the iris. He quickly ties the ca
it by two other catgut sutures, later
in by the loosened conjunctiva, draw
sutures. These are removed on th
sutures remain. Later, with the imp
ing, this can be given a very satisfact
gives a globe of almost normal volun
able base for an artificial eye, if it is

[Owing to the tendency I mentior
the Annals p. 480 (i. e. the law o
he does this operation under cocaine

Iridectomy In Irido-Cl

Abadie (*Soc. Franc. d'Ophtal,* M
clusions in iride-cherioiditis. No m
general treatment should be institut
of which should be mercury and s
affection fails to respond to this,
remaining stationary, iridectomy sho

With the formation of synechiæ t
sooner indicated, and where the sy
shutting off communication between

indication becomes imperative. For this condition is most prone to result in glaucoma. For the iridectomy one should not rest content that all possible had been done; for in these cases the above treatment should be continued during and after the operation.

Acute Glaucoma Following Iridectomy for Simple Glaucoma.

Opin (*Soc. Franc. d'Ophtal,* May, 1906) maintains that iridectomy in simple glaucoma is always useless, any may produce disastrous effects. He reports two cases. In the first, three days after the operation there was an attack of acute glaucoma; with typical symptoms; odema of the conjunctiva, greatly increased tension, diminution of vision, and severe pain.

In the second case there was the same sequel in the left eye; resulting in glaucoma absolute. The right eye, operated upon at the same time, appeared at least to support the operation, but the vision continued to diminish.

These facts, contrary to the older theories, seem to O. to support the view of Panas and Rochon-Duvigneaud that glaucoma is essentially an œdema of the vitreous. The iridectomy produces this œdema by an irritation of the ciliary nerves; reacting in their turn upon the chorioidal vessels.

Ocular Paralysis in Otitis Media.

Terson (M. and A.) (*Soc. Franc. d'Ophtal,* May, 1906) report two cases of ocular paralysis occurring in the course of an otitis media. These were in two children, with otitis of only moderate severity. In each there was paralysis of the abducens of the same side as the otitis. The paralysis was not accompanied by any intra-ocular changes, and disappeared with the cure of the otitis. He reviews the scanty literature of cases of Gervais, Bettman, Keller, Styx, Schubert, etc. In all cases it was on the same side; in nearly all cases it affected the abducens and in a few of the cases there was optic neuritis of the same or both sides.

The path and method of the involvement of the sixth from the tympanic cavity are obscure. The idea if "reflex paralysis" is practically meaningless. The spread by bone necrosis and cerebral abscess is very exceptional. The rich lmyphatic and nervous connections of the tympanic space with the venous plexus around the carotid in the cavernons sinus, and the close relations of the sixth with the carotid at this point, make this path the one most likely to be considered; although the exact manner may as yet be impossible of explanation. This pathogenetic question demands further attention.

Sero-Therapy in Post-Diphtheritic Paralysis.

Aubineau (*Soc. Franc. d'Ophtal,* May, 1906) comes to the conclusion, from his observations, that there is not the least doubt of the efficacy of the serum in the treatment of the post-diphtheritic paralyses. He has found it characteristic of this treatment that there is a rapid amelioration on the day following the injection. He has had relapses, and has found it necessary to double and even triple the first dose to reach a complete recovery. He has never used less than 230 cc. of the serum. In the face of the necessity for such doses one may hesitate, but it is nevertheless true that these diphtheritic paralyses are influenced by the serum, and are susceptible of cure if one does not hesitate to employ the necessary dosage.

[The fact that these paralyses practically always disappear spontaneously sooner or later, makes it very essential that we do not fall into the error of regarding a *post hoc* as a *propter hoc.* When we consider that the serum is essentially a prophylactic measure, and how comparatively inefficient it becomes as a curative agent in even the later stages of the acute infection, we are justifiably sceptical as to its value in these still later sequelæ.]

Paralysis of Upward Movement.

Cantonnnet (*Soc. Franc. d'Ophtal,* May, 1906) reports the case of a woman of 41, in whom this had come on without apparent cause. The movements of the eyes are arrested sharply in the horizontal plane, and it is impossible to pass above this. Crossed diplopia existed in all directions. The woman was neither syphilitic, tubercular nor hysterical. There was some arterio-sclerosis, and an aortic bruit at the first sound.

Little by little movements of elevation became more ample, and were normal about seven weeks after the onset. C. explains this by a hemorrhage and clot between the nuclei of the centers of coordination of the associated movements of the eye, and the centers of the oculomotor. The absorption of this permitted a return to normal.

[A simpler explanation would be such a hemorrhage between the anterior corpora quadrigemini.]

Expulsive Hemorrhage and Rupture of the Cornea.

Houdart (*Soc. Franc. d'Ophtal,* May, 1906) reports the case of an old man with cataract of the right eye associated with hypertension, shallowed anterior chamber, fixed pupil, and faulty light projection to the nasal side. Prodromic glaucoma symptoms in the other eye. Albuminuria. Local treatment.

Four years after, while crossing a field, there was a sudden attack of frightful pain in the eye and head, with loss of consciousness. Seen three hours after, the right eye was intensely swollen, with a blood clot projecting from the lids, and hanging over the check. The clothing was soiled with blood, and the crystalline had been recovered in a fold of the clothing. The rupture crossed the cornea almost horizontally close to the superior border.

[Without a more conclusive history than this, one may certainly doubt the possibility of any intraocular hemorrhage having sufficient force to cause a rupture of so tough a membrane as the cornea (or sclera). The hemorrhage was probably spontaneous, but the corneal rupture was almost certainly caused by striking when he fell unconscious to the ground.]

Ocular Troubles From Observing an Eclipse.

VILLARD (*Soc. Franc. d'Opthal,* May, 1906) sums up our knowledge of ocular injuries due to direct observation of the sun with the naked eye. These are chiefly impairment of vision and central scotoma. The amblyopia is a constant feature, although variable, at times slight, but often very marked. Generally it is transient, vision returning to normal in a few weeks or months; but occasionally it is permanent. But, although the amblyopia may be very marked, the pupillary reflexes to light and accommodation are retained.

The central scotoma is observed in all cases of injury to the eye from the solar rays; being always of the character of a positive scotoma, under the form of a dark spot more or less pronounced. At twenty metres it is of sufficient size to hide the face of a person, and in reading to make the recognition of ordinary type difficult or even impossible. It is generally circular in form, with sharp borders, and an extent varying from 4° to 8°.

Usually it appears as a fixed, immobile spot; but may show irregular oscillations, or a rotary notion—right to left, or left to right. Associated with the amblypoia may be metamorphopsia, or the ordinary form of muscæ volitantes.

The visual field is normal (unless exceptionally the color fields may be slightly retracted), and the color sense is normal.

The visible changes may be a deepened coloration around the macula, or a slight pigmentation making the yellow spot a little more pronounced; but the most frequent change is a minute hemorrhage exactly at the macula.

The prognosis, as seen above, is usually good; only an imprudent prolonged exposure being likely to leave permanent effects. The therapy consists of ant instituted as soon as possible after the eye in a darkened room, dark glasses, loup to the temple or mastoid, purgati torpor retinæ beginning to recover, the be employed; together with the admin either internally in sufficient dosage or tion.

Vaccinal Inoculation of the

. JACQUEAU (*Soc. Franc. d'Ophtal,* Ma of a woman, in whom there was an ac the eye from the arm of her child. She fering from a slight blepharo-conjunct a good soil. The lids were greatly sw chemosis. The conjunctiva was of a pa not of a vivid red. There was a little se very severe.

On the palpebral conjunctiva of the two small placques, of yellowish-whit membranous. At the lid border were ulcerations of the same character. Ba tion and cultures were negative, except no special pathogenic value. The pre-a and cervilcal glands were greatly swolle to touch.

Complete recovery followed rapidly complications. Minute cicatrices remain acteristic.

The dignosis was really made by exc upon the striking contrast between the flammation and the perfectly benign, rap

Malarial Ocular Affecti

BARGY (*Soc. Franc. d'Ophtal,* May, 19 that are representative of widely differin

In the first case, during an acute atta there occurred a hemorrhage into the v ness of the media never permitted the whether there had been a retinal hemorr although this is probable.

The second case was one that presente ena of the whole anterior segment of t out any symptoms of general fever. T ular intervals of four weeks, were then with neuralgia, and ceased under the adm

He regards this as demonstrative of a "larval" form of malaria. Their occurrence always in the same eye he held to be due to the fact that this eye had been injured in infancy, and was a point of least resistance.

Ocular Tuberculosis.

PECHIN, GOURFEIN. KALT AND DOR. (*Soc. Franc. d'Ophtal,* May, 1906) present papers on ocular tuberculosis, in addition to the paper of Carpenter and Stephenson abstracted in the last number of the ANNALS. This gives an idea of the interest in this subject abroad.

G. reports two cases of primary conjunctival tuberculosis in children (confirmed by animal inoculation). One died of cerebral tuberculosis and the other was cured by repeated excisions and cauterisations.

K. reports a case of conjunctival tuberculosis with advance by way of the ciliary body. Later pulmonary involvment.

P. reports two atypical cases; much like "Descemetitis," but here the round minute spots were arranged in a zone around the cornea—and not in the usual pyramidal-like group at the lower part of the cornea.

Ocular Arterio-Sclerosis.

ROHMER (*Soc. Franc. d'Ophtal,* May, 1906) submits a report on ocular arterio-sclerosis that is reallyl monographic, and should be studied in the original.

He first studies (in what are really chapters) general arterio-sclerosis and then the same condition as it affects the ocular vessels. Then follow successively chapters on the role of arterio sclerosis in; obstruction of the retinal vessels (embolism and thrombosis); retinal hemorrhages; relations with glaucoma, and finally a study of retinitis circinata.

ABSTRACTS FROM SPANISH
ICAN OPHTHALMOLOGIC

BY

DR. M. URIBE TRONCOS

ASSISTED BY

DR. JOSE DE J. GONZALES (

Ophthamia neonatorium as a Cause of
Importance of its Prevention by P
Among Doctors, Midwives

RAMOS, DR. JOSE, Mexico. (*Mexi*
and Anales de Oftalmologia, May —
000,000 in round numbers as the inh
must be, approximately, in her who
blind persons, a number which, comp
Mexico into the sixth place for her a
coming between Spain with 17,379
11,329. If we calculate the proportion
itants she occupies the fifth place.
cause of blindness is Ophthalmia-neon
bers 30 per cent; so that of the 15,0
4,500 owe their blindness to this disea

He proposes to diminish these cases
lactic or preventive measures: First
birth be made aseptic, and secondly, in
careful cleansing of the eyes, to use f
well recommended remedies, as nitrate
largol, solution of citric acid, etc.; but
to doctors, midwives, and the public the
For the two first the matter is easy;
instruct them in the clinics thorough
to distribute, now and then, papers on
peutic methods. As regards the publi
difficult; it may be divided into two
the illiterate; for the first, distribute sm
treaters, public promenades, among th
streets, street cars, etc.—and they mig
advertisements to fathers of families, etc
class, the illiterate, recourse must be ha
of religion and to the religious meeting
St. Vincent; to the ecclesiastical author
ers, etc.

To put these ideas in practice, he p
tion has been passed by the Mexican Op

for creating a Permanent Central Committee to work on these ideas.

Two Cases of Afasia Complicating Ophthalmic Migraine Caused by Defects of Refraction.

GONZALES, DR. JOSE DE JESUS, Leon, Mexico. (*Mexican Ophth. Society and Anales Oftalmologia,* July, 1905.) He describes two cases of astigmatism, in which the persons affected prolonged, after eye strain, had ophthalmic migraine, complicated with afasia. Neither of them had been previously nervous, both enjoying perfect health. The optical correction of the astigmatism was enough to make the headache disappear, and the cure has now lasted for four years.

Iridectomy in the Extraction of Senile Cataract.

ALONSO, DR. ANTONIO, San Luis Potosi, Mexico. After discussing the advantages and disadvantages of simple extraction and extraction with iridectomy, he decides for the latter, and ends his report with these conclusions: Combined extraction is the operation to be chosen; it is the more usual operation. The simple operation should be the exception.

Etiology of Diseases of the Tear Channels.

MONTANO, DR. EMILIO F., Mexico. (*Anales de Oftalmologia,* August, 1905.) He discusses the various theories explaining the passage of tears through the lachrymal channels; ascribing it to a physiological condition; the theory of aspiration, by the vacuum produced in the nose by inspiration, or, according to Richet, by the action of the orbicular of the eyelids, which at each wink dilates the bag; or, as Foltz says, by the action of closing the eyelids, which produces a kind of passive systole in the tear sac, which, by its own elasticity, returns to the diastole. He rejects these theories, and noting the anatomy of the tear channels, the rapid widening of the bore of the canaliculi at the level of the sac, and the general direction of the channels, he concludes that capillary attraction is the only force that drives the tears through their excretory ducts. He founds his theory on the following experiment: A capillary tube, one of whose ends is amply widened, rapidly and while the other is immersed in a liquid, requires no biological force to absorb the liquid; the physical force, called adhesion and which produces the phenomena of capillary attraction, is sufficient. He shows some glass tubes, similar in shape to tear ducts, by means of which he demonstrates the actual passage of a liquid through them by capillary attraction alone. He then studies the etiology of diseases of the tear channels which he

ascribes to cause that destroy capil
free passage of the liquid through tl
diseases he treats at length.

Etiology and Treatment of Disea

Galindo, Dr. J. Refugio, Tulan
mologia.) He holds the same ide
the preceding work, and presents
Automatic Irrigator for the tear du
band, fitted to the patient's forhead
elastic band. The steel band has tw
with a sloping ring to hold the irri
At the end of the tube may be pla
Anel's syringe. The height of th
changed at the will of the surgeon
apparatus works without being wa
allows the patient to move without g

Observation Regarding a Method of Al of the Corne

Gonzales, Dr. Jose de Jesus, Leo
formed in the following way: An
patient, and, after taking the prop
speculum is put in its place, an inci
junctiva round the limb with curve
is loosened as far as the equator of th
able to slip it off later on; then afte
three or four long needles and thr
the base of the staphyloma, but full in
the ciliary region. When this is don
nea is punctured with De Graefe's kn
the horizontal diameter, making an
operating cataract, and the excision
ward is completed. The threads
knotted, and the conjunctiva slipped
ports that of the cornea.

A Practical Demonstration of the Filt Through Schlem's Channel with

Uribe y Troncoso, Dr. M., Mex
mologia and Mexican Ophth. Society
the following conclusions: First, *1*
meter does not measure the real filtr
of liquid from the eye, but merely
chamber may hold, and which depe
less resistance offered by the vitreous

and also upon the pressure with which the liquid is injected into the eye, which pressure gradually decreases in the manometer during the experiment. Secondly, a part of the liquid usually escapes filtration and accumulates within the eye; and this makes the apparent filtration appear much more than the real one. Thirdly, the filtration of *albuminous liquids* is much less than that of saline ones, generally from two-fifths to three-fifths of the latter; but the concentration of the solutions does not proportionately affect the decrease, on account of the short time the experiment lasts. Fourthly, in investigations with dead eyes the figures obtained for normal filtration are too high, owing to the want of the pressure existing on the vitreous humor during life. Fifthly, when pressure is being increased on the viterous humor filtration gradually decreases, till it completely stops. This is due to the *application of the root of the iris to the cornea,* which mechanically obstructs the excretory canals. Sixthly, the difficulty in the filtration of albuminous liquids, in the first place, and the mechanical closing of the filtration channels by the increase of pressure from behind, account fully for the mechanism producing the symptoms that characterize glaucoma.

Diagnosis and Treatment of Syphilitic Eye Diseases.

GRAUE, DR. ENRIQUE, Mexico. (*Anales de Oftalmologia,* February, 1906.) From this extensive study we take only the following data, collected in the Ophthalmic Hospital of Our Lady of Light (Hospital Oftalmico de Nuestra Senora de la Luz), Mexico: Among 36,000 patients attended from May, 1876, to February, 1905, it was found that 690 has syphililtic diseases, 2 per cent approximately, classified as follows:

Hereditary Syphilis.—Iritis, 6 cases; chorioidal changes, 8 cases; pigmentary retinitis, 17; congenital coloboma of the iris, 1; interstitial keratitis from syphilitic inheritance, 82 (0.22 per cent); (among the 36,000 patients there were 174 cases of interstitial keratitis, or 47 per cent of the grand total.)

Acquired Syphilis—Chancre on the eyelids and conjunctiva, 6; specific ulcers of the eyelids, 9; interstitial keratitis from acquired syphilis, 8; iritis, 184; gummas on the iris, 3; iridoclytis, 20; chorioiditis, 115. Of these latter 62 were irido-chorioiditis, and 53 areolar, disseminated and peripherical forms. Chorioido-retinitis, 46; retinitis, 10; neuroretinitis, 31; syphilitic papaillitis, 9; postneuritic atrophy, 21; simple atrophy, 19.

Syphilis in the Tear Excretory Apparatus, 26; syphilitic osteoperiostitis, 5; paralysis of the eye muscles, 34; of the oculo-motor, 25; of other nerves, 9.

Parasyphilis—Tabetic atrophy, 29.

Indications of the Cycloplegics in Determining Defects of Refraction.

GONZALES, DR. JOSE DE JESUS, Leon, Mexico. (*Anales de Oftalmologia,* March, 1906.) He condenses his paper into the following conclusions: To determine correctly ametrophy the cycloplegics should be applied: First, to hypermetropes, less than 35 years old. Secondly, to astigmatic persons of the same age. Thirdly, to myopes who suffer from spasms of the accommodation, also to nervous and excitable persons. We need not use cycloplegics: First, for ametropes over 35 years old; secondly, for hypermetropes attacked with paresis of accommodation; thirdly for the myopes who have no accommodating spasms. No subjective examination of refraction should be made under the influence of cycloplegics.

Observations on Cycloplegics in Determining Ocular Refraction.

URIBE Y TRONCOSO, DR. MANUEL, Mexico. (*Anales de Oftalmologie,* May, 1906.) He recommends the cycloplegics in children; in cases of weak and mixed astigmatism; where spasms of the accommodation are suspected; in slight shortsightedness; for hypermetropes, especially children who suffer from strabism; but for adults, he does not think them absolutely necessary, but considers a gradual correction better, limiting himself to correcting the manifest hypermetrophy. He gives statistics of 1,000 cases among his private patients, in which the refraction has been carefully studied and measured, first, with the ophthalmometer, then by skiascopy, and lastly by a subjective examination. In the 1,000 cases, cycloplegics were used in the proportion of 17.9 per cent. In 80 per cent they were not used. The former give this result: Pure, 10.90 per cent. Simple myopic astigmatism, 23.19 per cent. Compound myopic astigmatism, 16.06 per cent. Pure hypermetropya, 7.07 per cent. Simple hypermetropic astigmatism, 19 per cent. Compound hypermetropic astigmatism, 22.4 per cent. Mixed astigmatism, 38.5 per cent.

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY.
COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting October 16, 1906. Dr. G. E. de Schweinitz, Chairman, presiding.

Dr. Howard F. Hansell reported a *Case of Bilateral Abducens Paralysis, Traumatic in Origin,* published in full, page 529.

Dr. E. A. Shumway showed a patient with *Double Rupture of the Sclera, by the Blow of a Fist.* The two openings were at opposite ends of the horizontal meridian of the cornea about 3 mm. back of the corneo-scleral junction. Through both openings vitreous and pigmented tissue were hanging at the time of the first examination. A low-grade cyclitis set in ten days after the accident, but slowly disappeared under treatment with mercury, and salicylates internally, and atropin, dionin, leeching and subconjunctival injections locally. With the rupture there were associated iridodialysis of the upper half of the iris, subluxation of the lens, and intraocular hemorrhage. Enucleation had been advised, on account of danger of sympathetic ophthalmia, but was declined. Dr. Shumway had been unable to find a similar case of double rupture in literature, and was inclined to consider it unique.

Dr. de Schweinitz said that he had never before seen a patient with double rupture of the sclera of exactly this character. He had watched the case with Dr. Shumway, and the eye had the appearance as though a sharp instrument had penetrated through the ciliary region from one side to the other, but the man was positive that no such instrument had been in the hands of his assailant when the blow was struck. He had been impressed particularly with the good effect of the salt injections in the treatment of the case, and thought that the favorable turn in the case had been due directly to their influence.

Drs. G. E. de Schweinitz and C. M. Hosmer described the microscopic appearances of a *Congenital Tumor of the Corneoscleral Junction, with Gland Inclusion,* of pinkish-white color, which straddled the corneal margin and was of a size of 8 by 6 mm., and which was associated with a smaller similar growth separated by an opaque margin situated entirely upon the corneal tissue. The growth was covered with stratified epithelium which was analogous to corneo-conjunctival epithelium and not epidermal, and the main body of the growth was composed of a glandular and a fibrous portion.

The glandular portion was made up of fine acini and ducts, with epithelial cells regularly placed upon an unbroken membrane, and the type of the gland was that of a lacrimal gland, that is, of a serous gland, and resembled in all particulars Krause's gland. They discussed the various tumors which are found in this situation of analogous nature, namely, the true dermoids of the corneo-scleral junction, the true but rarely found dermoids of the cornea, and the teratoid tumors, and thought that their own case was more nearly like the one which had been reported years ago by Fuchs, in which, however, the entire tumor had been located upon the cornea, and resembled the teratoid tumors, in the presence within it of the acino-tubular gland which has just been described. In their demonstration they showed sections of true dermoids, and also of the teratoid tumor which is ordinarily known as a dermo-lipoma, and which is situated upon the scleral expansion between the superior and the internal rectus, and which at one time was supposed to be true subconjunctival lipoma.

Drs. de Schweinitz and Hosmer reported *Two Cases of Epithelioma of the Lid in an Early Stage,* both of which had developed in the eyelids of elderly persons from ordinary flat warts which had been irritated by being picked at and treated with salves. The microscopic examination of the excised growths revealed typically the lesions of ulcerating epithelioma of the skin corresponding to the type of carcinoma basi cellulare. There had not been the slightest return of the growth after two years in one case, and fifteen months in another, and the authors pointed out the importance of the early excision of these growths, even when they had not far passed the stage of their wart ancestry, and called attention to the fact that although the x-ray therapy of epithelioma of the lid was brilliant in its results, it was not applicable to lesions of this character, which were much better treated by prompt radical excision. They also reported the microscopic appearances of a growth which had in all respects resembled clinically a sebaceous cyst, but which proved to be an adenoma in which a number of the acini showed a break in the limiting membrane, with an outwandering of epithelial cells indicating the beginnings of a malignant process, and the presence of an adeno-carcinoma, and they again urged the early excision of growths of this character.

Dr. Randall mentioned a case which he had reported before the American Ophthalmological Society, of a *Spindle-cell Sarcoma of the Lid,* which had been operated on twice before under the impression that it was a chalazion. He had recognized the true nature of the growth by the pigmentation beneath the skin surface, and the appearance of the vessels over it.

Dr. Hansell spoke of Dr. Keen's paper on the tendency of warts to become malignant, and agreed with Dr. de Schweinitz that excision should be done in such cases when the growths were small, and before they had commenced to undergo malignant change.

Dr. de Schweinitz, in conclusion, said that he did not want to be understood as condemning the x-rays in the treatment of proper cases, but he thought the tendency to wait, and submit small growths to the x-rays was too great. When they were small and clearly defined from the surrounding tissue, excision was the proper method, and was successful. In late stages, when the growths are so large that operative interference would be disfiguring, the x-rays are especially useful.

Dr. Wm. Zentmayer presented a case of *Embolism of a Cilio-retinal Artery* in a man 21 years of age. Published in full, pp. 534.

Dr. C. A. Veasey exhibited a *Case of Keratitis Disciformis* in a male laborer, probably produced by injury from a particle of dirt or stone. The disc-like area of opacity was about 3 mm. in diameter, situated near the apex of the lower inner quadrant of the right cornea, and was much more dense in the center and at the margin than in between. Under magnification the opaque area resolved itself into numerous small dots, but the adjacent cornea was well defined and not infiltrated. The overlying epithelium was roughened, slightly anesthetic, but unbroken, and did not stain with fluorescin. Vision, which was 20-100 in the beginning, was improved to 20-70 after five months' treatment by massage with yellow oxid ointment.

Dr. C. A. Veasey also exhibited a *Case of Fulminant Retrobulbar Neuritis.* The patient, a male aged 39 years, stockkeeper in a toy store since boyhood, in apparently good health, had the vision of both eyes totally abolished in 12 hours. The pupils were widely dilated, not reacting to light, and, excepting the total blindness and some deep-seated pain upon pressure of the eyeballs, there were no other symptoms. All examinations were negative, except that the urine revealed a trace of albumin and a few hyaline casts which afterward disappeared. Six days from the appearance of the blindness the vision in one eye began to return, and two days later in the other, so that the fields were those of a right homonymous hemionopsia. A few days later the blind halves cleared up, but the nerves have become atrophic, central scotomata remain, and the vision of the right eye is 1-135 and of the left 6-12.

Dr. de Schweinitz said that Dr. Veasey's second case in many respects resembled those due to methyl-alcohol poisoning, but that cause was apparently absent. It was interesting from the fact that no toxic process had been discovered which would account for it.

Dr. Turner had watched the patient with Dr. Veasey and suggested, that the fact that the man was handling lead toys in his occupation, indicated the possibility of a lead intoxication. No lead had been discovered in the urine, but he thought this might be due to its elimination by the iodides, which had been administered in the treatment of the case.

Dr. Wm. Campbell Posey exhibited a *Bedside Ophthalmic Examination Case,* containing in compact form apparatus and lenses sufficient to make a complete functional examination of the eye.

Dr. H. Maxwell Langdon (by invitation) showed a case of advanced *Neuro-retinitis Associated with Nephritis* in a young woman 28 years of age. The blood pressure was 235. Except for scarlet fever when a child, and diphtheria six years ago, the patient's history was good.

EDWARD A. SHUMWAY, M. D.,
Clerk of Section.

BOOK REVIEWS.

The Eye and the Nervous System; Their Diagnostic Relations; by Various Authors.

Edited by WILLIAM CAMPBELL POSEY, A. B., M. D., and WILLIAM G. SPILLER, M. D., Philadelphia. Published by the J. B. Lippincott Co. of Philadelphia. Octavo. Price $6.00.

This work of 998 pages is a collection of carefully edited monographs by twenty-two contributors, covering every phase of neuro-ophthalmology. The need for such a work in the English language has long been recognized, more perhaps by ophthalmologists than by neurologists, but both branches of the profession will find in this book much valuable information, classified and well-arranged. The editors have been most happy in their selection of contributors, many of whom have been for years identified with their particular subjects.

So well have the individual chapters been covered and fitted together, that repetition and conflict, so likely to occur in a joint production of this kind, are practically eliminated.

The introductory chapter by Wm. G. Spiller, M. D., treats in a clear and concise manner of the *intra-cranial portion of the encephalic nerves, especially those related to the eye.* The anatomical relations of these structures are given, and where different views are held by other observers they are recorded and logically discussed.

Chapter II, by Wm. Norwood Souter, M. D., upon "*Sight: The Structure and Optical Properties of the Eye,*" describes briefly but sufficiently the anatomy of the eyeball, the eye as a refractive apparatus, and the various anomalies of accommodation and refraction.

In Chapter III, Charles K. Mills, M. D., describes at considerable length the *psychology of the visual act and the focal diseases of the visual cortex.* An introductory outline is first given, followed by sections upon the limits and sub-divisions of the visual cortex; the histology of the visual cortex; the positions and sub-divisions of the primary cortical visual area; focal diseases of the visual cortex, hemianopsia and other defects in the visual fields due to cortical lesions; cerebral chromatic phenomena and color recognition, amblyopia, due to disease of the visual cortex; mind blindness, word blindness, agrammatism and word dumbness. The text is well supplied with illustrations and diagrams which are a great help to the reader in understanding this rather intricate subject.

Chapter IV is by Case A. Wood, M. D. It treats of *the* *general examination of the exterior of the eye and its surroundings; perimetry, color-blindness, peripheral blindness, subjective visual sensations, and amblyopia.* This chapter is devoted to definition and method. The methods of carrying out these various examinations are described much as they are in all standard text-books; there are numerous illustrations, taken mostly from "Norris and Oliver" and "Possey and Wright."

Chapter V, upon the *extra-ocular muscles,* by Alexander Duane, M. D., represents the careful work of years, and contains practically the sum total of our present knowledge of this subject. In clearness and directness it is characteristic of the author.

John E. Weeks, M. D., has contributed Chapter VI, treating of the *intra-ocular muscles.* The anatomy of the iris, the normal pupil and the methods of examination and elicitation are fully described. The various light and other reflexes with their mechanisms are made perfectly clear in a brief but forceful manner. The chapter is satisfactorily concluded by a section on the pathological variations in the pupil.

Chapter VII, by Edward Jackson, M. D., is an important one to ophthalmologists, and will be read with much interest and profit. It has for its subject the *Peripheral Affections of the Fifth, Seventh and Cervical Sympathetic Nerves; Ocular Lesions caused by them, and their treatment.*

The many affections referable to these nerves are described in a manner which will appeal strongly to the clinician. Among these affections are some of the most obstinate with which the ophthalmologist comes in daily contact, and a closer study of them will certainly render more productive our efforts toward their relief. Lid signs and lid reflexes, as well as ptosis and its operative treatment, are also considered.

Chapter VIII is by H. V. Würdemann, M. D. *The Diseases of the Retina and Optic Nerve which are of Significance in Relation to General Disease*, are dealt with in a clear and practical manner.

Under a general heading of *Ophhalmoscopic Signs of General and Nervous Diseases,* are included: 1. Sensory affections; 2. Vascular lesions; 3. Inflammation of the retina; 4. Inflammation and edema of the optic nerve; 5. Atrophy of the optic nerve. The chapter is fully illustrated by numerous figures in the text, four full-page half-tones, and four pages of photochromotypes depicting twenty-two fundus conditions. These latter show well the conditions intended and are well selected; some of them, however, are perhaps a little crude in coloring and general effect.

Tumors and other Lesions of the Brain, especially those in Relation to the Visual Apparatus and Ocular Nerves, is the subject considered in Chapter IX, by William G. Spiller, M. D. This chapter is an exceedingly valuable one and should be studied by every ophthalmologist who pretends to do justice to that branch of medicine. The author's name is a guarantee of its accuracy and thoroughness, and it is based throughout upon actual cases seen by him or others of wide experience. Little space is given to theorizing, but the necropsy is called upon in most cases to reveal the actual pathological condition. In this way it is particularly satisfactory, and inspires the reader with the belief that real progress is being made, and that the accurate diagnosing of intracranial lesions need not be guesswork.

Chapter X. *Bulbar and Pseudo-bulbar Diseases, E. W. Taylor, A. M., M. D.* The importance of the medulla oblongata, due to the fact that so many vital nerve mechanisms are gathered within such a small compass, as stated by the author, justifies a special consideration of the diseases affecting this part of the brain.

Bulbar paralysis, bulbo-pontine hemorrhage, bulbo-pontine softening, superior encephalitis (Wernicke), chronic ophthalmoplegia, pseudo-bulbar paralysis, myasthenia gravis and paralyzing vertigo (Gerlier's Diseases), are all fully described as to history, pathological anatomy, symptomatology, prognosis and treatment. The author's style is clear and convincing, and the reader will have many vague and hazy ideas crystalized into usable form.

Chapter XI, by William Hirsch, M. D., is a very short one treating briefly of the ocular changes found in *Arteriosclerosis, Multiple Sclerosis, Pseudosclerosis. Diffuse Sclerosis, Friedreich's Disease, and Paralysis Agitans.*

Arteriosclerosis especially has commanded a great deal of attention in the last year or two, and as our knowledge of this general process increases, we find more reasonable explanation for many ocular conditions, the pathology of which has been little understood. The importance of arteriosclerosis therefore would seem to warrant a more extended description than the four pages here allotted to it.

F. X. Dercum, M. D., has contributed Chapter XII on *Parasyphilitic Affections, Insanities, and Toxic Encephalopathies.* Here is found a most lucid description of the ocular phenomena occurring in paresis, tabes, functional insanities, alcoholic intoxication, and lead intoxication. The statistics pertaining to these subjects are fully given, and will enhance the usefulness of the chapter. The author has furthermore closed each section with a summary which will be appreciated by those in need of ready reference.

Amaurotic Family Idiocy and Cerebral Palsy of Childhood, is the subject of Chapter XIII, by B. Sachs, M. D. The name of the author has for some time been closely identified with the literature of amaurotic family idiocy, and in this monograph he has detailed practically all that is definitely known of this peculiar morbid condition.

Chapter XIV. *Abnormalities in the Development of the Brain and Skull; Facial Hemiatrophy; Facial Hemihypertrophy; Acromegaly.* These conditions are defined and described by Charles W. Burr, M. D.

A typographical error is responsible for the marked improvement in the visual fields (opposite page 564) in the case of acromegaly from 1885 to 1892; the dates should be reversed.

In Chapter XV, T. H. Weisenberg, M. D., under the general title, *Diseases of the Spinal Cord and Spinal Nerves,* discusses myelitis; syringomyelia; the relation of ocular symptoms to spinal cord diseases; primary lateral sclerosis; amyotrophic lateral sclerosis; progressive ascending unilateral paralysis; posterolateral sclerosis; spinal-cord symptoms in pernicious anemia; injuries of the spinal cord; Landry's paralysis; diseases of the nerves; and multiple nueritis. This is a particularly full chapter, and the author has kept in mind throughout the needs of the ophthalmologist. The ocular symptoms of these various diseases are fully elaborated, without, however, in any way destroying the necessary balance which is a conspicuous feature of this chapter.

G. E. deSchweinitz, A. M., M. D., contributes Chapter XVI upon *Neuroses and Psychoses.* This chapter, which the reader will recognize as one of the strongest in the book, is very complete, and contains a full discussion of the ocular phenomena of hysteria, as well as of those pertaining to neuresthenia and the traumatic neuroses, hypochondriasis, hypnotism and sleep. It is concluded by a description of some of the more important tests for the detection of simulated blindness.

Migraine, Tetanus, Tetany, Epilepsy, and Blindness due to Uremia and other Blood States, are the affections considered in Chapter XVII, by James Hendrie Lloyd, A. M., M. D. The history and description of migraine are particularly interesting, and it will be noted that in considering the relation of eyestrain to migraine, the author places a check on some of the widely propagated views of a few who can see nothing but astygmia as a cause for almost all diseases. The chapter contains a full and useful bibliography.

Chapter XVIII is contributed by S. D. Risley, M. D., and Howard F. Hansell, A. M., M. D. It treats of the *Neuroses and other Conditions occasioned by Errors of Refraction and Imbalance of the Extra Ocular Muscles, and the effect of Lenses and Operatic Procedure in relieving the same.* Dr. Risley in Part I discusses headache and neuralgia, in their relation to eye-strain. The author prefaces his discussion with five propositions which he subsequently defends with numerous illustrative cases. He maintains (1) that in a large number of cases ocular anomalies are the sole and sufficient cause of headache; (2) that the absence of symptoms obviously referable to the eyes, does not exclude those organs as an etiological factor in headache and certain associated symptoms; (3) that the congenital origin of ocular anomalies does not exclude them from participation as a factor in sudden or recent development of symptoms coming on during or after middle life, following acute disease or some general dyscrasia; (4) the eye as an etiological factor in headache and other neuroses can only be excluded in the absence of ocular disease, or after correction of refractive error or abnormality in binocular balance; (5) in many cases prolonged eye-strain sets up pathologic fundus conditions, requiring time for recovery; therefore, immediate relief of symptoms is not always to be expected.

In Part II, Dr. Hansell gives an excellent account of epilepsy in its relation to eye-strain, and discusses further, chorea, vertigo, gastric disturbances, general asthenopia, and the spasmodic movements of the head other than choreiform.

The chapter is an important one, as it comprehends subjects which have in the last few years been very fully discussed not only from a scientific standpoint, but unfortunately from the standpoint of popular science as well as charlatanism. Both authors have given a dispassionate, conservative and safe discussion of the questions involved.

Chapters XIX and XX are by William Campbell Posey, M. D., upon *Exophthalmic Goitre, and the Psychological Effects of Operations upon the Eyes.* Both chapters contain a full and useful bibliography. A well arranged description of exophthalmic goitre is given, and the author seems to have brought out most of the known phenomena essential to the diagnosis of the disease, without the interjection of prolonged and unnecessary disscussion. In this respect he has perhaps been too brief in discussing the pathology, but his conclusion that "the entire question of the essential factor or factors in the production of exophthalmic goitre must still remain *sub judice,*" furnishes the key to the situation. Dr. Posey's views upon the surgical treatment are conservative and should be well considered by those contemplating operation for the relief of this disease.

In Chapter XX Dr. Posey discusses the *Mental Effects of Eye Operations.* The first section deals with the relief of insanity by eye operation. Several cases are cited which would seem to show that this end is occasionally accomplished in the insane by the extraction of cataract. The author is convinced that the connection between cause and effect in the cases reported by himself was too close to deny the direct influence of the restoration of sight upon the mind.

The second section of the chapter treats of the *mental disturbances after eye operation.* The several theories advanced for the explanation of these complicating phenomena are reviewed, the author finally concluding that the chief cause of the delirium after operation upon the eye is largely psychic, and he agrees with Parinaud that it is due to the preoccupation upon the part of the patient prior to, and after operation.

Chapter XXI, the *Surgical Treatment of Intracranial Lesions causing Disturbances of Vision,* is by Charles H. Frazier, M. D. In association with Dr. Mills and Dr. Spiller the author has had exceptional opportunities for work of this kind. The chapter is interesting and instructive, and gives clearly the indications for operation as well as the technique. The surgery of the seventh and fifth nerves is also carefully described. The advances made in brain surgery in the last five years are demonstrated by a few comprehensive tables.

Joseph Sailer, M. D., contributes Chapter XXII, upon *Tremors, Reflexes and Gaits.* These subjects are elaborated in a most systematic manner, and the chapter adds greatly to the completeness of the book. The reader is told how to elicit the many reflexes, the mechanism of each particular reflex, and the significance of its presence or absence. A classified reference table on the literature of the reflexes is at the end of the section.

The section on gaits describes the methods of study as well as the deviations from what is normal, as found in the various forms of nervous disease. Three full page plates are given showing graphically the recorded gaits of eleven subjects including both normal and abnormal types.

The concluding chapter, XXIII, is by G. L. Walton, M. D., on *Degeneracy*. (Degeneration, Constitutional Defects, and Deviations.)

The author presents a strong plea for a more restricted use of the term degeneracy, which owes its great popularity to the writings of Lombrose and his student Nordau. He shows clearly that many of the so-called stigmata of degeneracy would be better known as deviations, and that the possessors are *deviate* rather than *degenerate*. The chapter is well illustrated and supplies much interesting information not ordinarily accessible to the practising physician.

The *Index* has been prepared by Dr. Paul La Roque. Although it necessarily contains a great many references, it is by no means complete, nor are the references in many cases well selected. The system adopted seems to be original and will doubtless cause much confusion.

The publishers have supplied a high grade of paper and good presswork. There are of course some typographical errors, but most noticeable is the absence of uniformity in spelling, for which the publishers are probably not responsible, as each author has his own ideas which must be respected. Among the words spelled in more than one way are: disk (optic), lacrimal, exophthalmos, enophthalmos, lagophthalmos, aneurysm, astigmia, hyperopia, and those words that formerly required diphthongs, such as anemia, hyperemia, ischemia, edema, etc.

Such criticism, however, cannot detract from the real value of this work to all who are interested in the contained subject matter, and it must be received as a notable and timely acquisition to medical literature, for the production of which the authors and editors are deserving of credit and congratulation. WM T. SHOEMAKER, M. D.

The American Illustrated Medical Dictionary.

By W. A. NEWMAN DORLAND, A. M., M. D. Fourth Revised Edition. Octavo of 836 pages, with 293 Illustrations, 119 of them in colors. Published by the W. B. Saunders Company, Philadelphia and London. 1906. Price, flexible morocco, $4.50.

The present edition of this well-known dictionary has been thoroughly revised and brought to date. More than two thousand new words, and one hundred new tables have been added. The tables are complete and conveniently arranged, and furnish all that could be desired in a book of reference. The author has admirably combined the dictionary or word-book principle with that of the encyclopedic idea, and while giving in every case full but concise definition, gives also such collateral information as the worker in medicine, surgery, dentistry, pharmacy, chemistry, etc., would be likely to seek. The latter feature of the book makes it particularly useful, and after use, indispensable. The illustrations are all on full pages, either single or grouped, and are furnished with descriptive legends. This arrangement is attractive, and allows the text to run uninterruptedly, so that desired subjects are more readily found. Mechanically the book is an example of skillful workmanship, and will do what so many books will not do—remain open without force at any one of its eight hundred and thirty-six pages. WM. T. SHOEMAKER, M. D.

Prevalent Diseases of the Eye.

A reference handbook, especially adapted to the needs of the general practitioner and the medical student. By SAMUEL THEOBALD, M. D. Octavo, 551 pages, with 219 illustrations and 10 colored plates. W. B. Saunders Company, Philadelphia and London, 1906. Price $4.50.

The author of this book has endeavored to supply what he considers a real want, i. e., not a complete treatise upon diseases of the eye, but a concise description of the commoner ocular maladies, designed solely to meet the needs of the physician *engaged in general practice.*

He recognizes, and states clearly, how far the general practitioner should go in the treatment of the eye, and warns him wherever necessary of the dangers and risks which may be encountered in ophthalmic practice. In this respect the book cannot help but be of value in the field for which it is intended. While it might be thought that such a work would encourage those of limited knowledge and experience to attempt, perhaps disastrously, the conduct of any opthalmic case presenting, Dr. Theobald has rather encouraged them to be conservative, by his concise description of the diseases, their diagnostic points, their complications and sequelas, and their prognoses. The functional examinations of the eye are described, and the practical methods of examination given, in a manner which can be easily understood by any reader, and will be a great help to one not constantly or frequently in the atmosphere of ophthalmic practice.

The illustrations are exceptionally good. The colored plates, ten in number, portray mostly external diseases, and are perhaps the best reproductions of actual conditions to be found in any recent text book. Most of the water color sketches are the work of Samuel Theobald, Jr., and are very accurate in every detail. An appendix contains a useful collection of prescriptions with their indications.

It is to be hoped that this book will find a wide distribution, and supply the want so carefully looked after by the author.

WILLIAM T. SHOEMAKER, M. D.

History of the German Hospital of Philadelphia and its Ex-Resident Physicians.

Octavo, 187 pages. Press of the J. B. Lippincott Co., Philadelphia, 1906. Price $4.00.

This is a unique volume, of great value to those interested in its subject matter. It has been written and compiled by Albert G. Miller, A. M., M. D., the Historian, with the aid of the Advisory Committee of the Association of Ex-Resident Physicians of the German Hospital of Philadelphia, to whom great credit is due for the completeness and general excellence of the material presented.

The frontispiece is a splendid likeness of John D. Lankenau, the benefactor of the hospital, to whose memory the volume is affectionately and reverently dedicated. A biography of Mr. Lankenau is followed by a detailed account of the hospital, its management and its accomplishments from its inception to the present time, written by Dr. Miller. A valuable illustration connected with the history is a picture of the original hospital building, the old homestead of William Norris, which was situated at Twentieth and Norris streets. After this building was purchased by the hospital, it was seized by the Government, and was known as Turner Lane Hospital during the Civil war.

"Early Recollections," by G. A. Schwarz, of the Board of Trustees; "The Resident," by Dr. J. Claxton Gittings, and "Reminiscences," by Dr. Charles S. Turnbull, vividly link the past with the present and are not the least interesting of the contents of the volume. A short biographical sketch of each ex-resident physician is accompanied, with few exceptions, with a phototype of the subject.

Throughout the book are numerous half-tone illustrations of the hospital buildings, wards, operating room, etc., which cannot be surpassed in general excellence. The press work is exceptionally good, making the volume as a whole one of the most attractive of its kind ever published.

A. D. WHITING, M. D.

Lecons de Therapeutic Oculaire.

By A. DARIER. Third Edition. Paris. 1906.

At a recent medical meeting, with the inevitable discussion raging over the evils of present-day therapy, the writer charged these up to poor grounding in materia medica, and consequently an inability to assimilate the mass of new remedies constantly pouring in upon us.

One of the members retorted that the oculists, with not over eight or ten groups, comprising not over two-score of individual remedies to handle, *ought* to be able to know these from A to Z, like they do the letters of the alphabet. This had to be admitted; but in reading over the smooth and limpid French of these lectures, I was led to question whether we *do* know our therapy as we should.

These Lecons, delivered as the course of lectures of the Faculty of Medicine of Paris, have all the personal charm that spoken words carry; and pictures the individuality of one who has contributed as much to the brilliant advance of ocular therapeutics in the last two decades as has any other contributor.

The lecture form has some drawbacks. There is a lack of that system, arrangement and classification that we are accustomed to associate with a manual of materia medica; but there is a consequent lack of the dryness that we also usually consider as the necessary accompaniment. The lecture form leads at times to unnecessary amplification; thus in the present treatise three lectures and a part of a fourth are devoted to an almost polemic discussion of the silver salts—but it is fought to a finish. At another point the author drifts into a 20-page discussion (with 22 figs.) of the teeth in parenchymatous keratitis of heredito-syphilitic origin. But although out of place, it is the most interesting treatment of this subject of which I know.

The above remarks must not be construed as charging an entire want of system; on the contrary, there is a most helpful and illuminating classification:

A—Modifiers of superficial sensibility: Local anesthetics, like cocaine, etc.

B—Modifiers of deep sensibility: Analgesics, like dionin and the morphia derivatives.

C—Modifiers of muscle tonus: Mydriatics and myotics.

D—Modifiers of vasular tonus: Vaso-constrictors, like adrenelin; vaso-dilators, like dionin.

E—Modifiers of secretion: Astringents and topical applications.

F—Antiseptics.

G—Physical agents.

The first 15 lectures take up the above groups, and discuss them from physiological standpoints, and apply them therapeutically. The following eight lectures discuss the special local treatment of affections of the conjunctiva, cornea and sclera. The last lecture treats of ocular tuberculosis.

To show how faithfully the sub-title, "*basees sur les decouvertes les plus recentes,*" is carried out, is illustrated by the fact that I find incorporated into the body of the book the data of a paper read at the May, 1906, meeting of the *Societe Francaise d'Ophtalmologic.* In like manner serum therapy; use of tuberculin; the metallic ferments, like collargol; intra-venons injections; the action of radium;, etc., are presented in the light of our latest knowledge. In fact, in some instances, this being the first adequate presentation outside of the original research publications.

Only five years have elapsed since the second edition, and comparison of the two shows that we *have* made a distinct advance. This edition is likewise equally worth of an English translation. DAVID DEBECK.

41
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